



Te Kaunihera-ā-Rohe o Ngāmotu

NEW PLYMOUTH DISTRICT COUNCIL

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MT MESSENGER BYPASS

Update to the Section 42A Hearing Report, 30 July 2018

DSN17/44711

Notice of Requirement to Alter a Designation for the construction, operation and maintenance of the Mt Messenger Bypass, including request for a waiver of the Outline Plan requirement

LUC18/47193

Land Use Consent to disturb potentially contaminated soil

Executive Summary

The following comments are to provide the Hearing Commissioner with an update to the New Plymouth District Council Section 42A report, prepared by myself, Rachelle McBeth. Since finalising the S42A report on 18 May 2018, NZ Transport Agency and the Director-General of Conservation jointly requested a deferral of the hearing on the Mt Messenger Bypass Notice of Requirement (NOR) and Resource Consents. Since May, NZTA has attempted to resolve issues and respond to matters raised in submissions and in the Section 42A reports. NZTA have revised their proposed conditions and management plans, and this update relates to the Applicant's evidence submitted following circulation of the S42A reports, including supplementary evidence (17 July 2018), where this evidence affects conclusions and recommendations made in my S42A report.

I summarise my revised conclusions and recommendations as follows. These matters are explained further within this document:

Options assessment:

- I now accept the landslide at the northern end of the existing alignment to be bypassed to be a strong basis for the NZTAs selection of an offline option.
- The reasons for the selection of the proposed route over an online route have been further demonstrated, however some matters regarding the decision to select the proposed route remain unaddressed or unclearly demonstrated.
- While the engineering solutions for the proposed route are considered feasible, the costs required to address geotechnical challenges may be considerable and these have not been presented comparatively to the landslide mitigation required for an online route, in terms of the options assessment.
- All options considered in the Assessment of Alternatives were fatally flawed in terms of cultural scorings provided by Ngāti Tama. Therefore, the Runanga do not appear to have a preferred option.

Conditions:

- I consider that access issues and the future status of the existing road is an effect of the designation to be considered within the hearing of the NOR, and that conditions on the designation would be appropriate to address this effect.
- I am in support of the proposed revised conditions which provide for peer review of engineering and landscaping aspects of the works, and greater certainty as to outcomes. I

consider this should be extended to include an independent safety audit of the tunnel design.

- I do not support the proposed 'preparatory works' being allowed for within the conditions as the project has been assessed as a whole and it would be inappropriate to allow permitted activities to be carried out separately, making monitoring very complicated.
- I support the revised conditions regarding the Outline Plan requirements. I now accept that if through the hearing the management plans are considered fulsome and acceptable to avoid, remedy, offset and compensate environmental effects, then there does not need to be a further Council certification stage. However in their current state I do not consider the ELMP, CEMP and CLMP to be ready for certification.

Options assessment

Significance of landslide

1. Since finalising the S42A report, Council's consultant geotechnical engineer Russell Allison has considered information referenced in Mr Symmans' geotechnical evidence and has had discussions with Mr Symmans to better understand the landslide at the northern end of the existing road proposed to be bypassed, which is cited as a significant reason for not selecting an on-line option. At the time of finalising the S42A report I considered there was an absence of detail regarding the degree of activity of the landslide and the level of engineering required to mitigate its impact.
2. Please see the attached letters from Mr Allison dated 6 and 18 June 2018 (**Appendix A**). Having considered evidence submitted by NZTA and in light of the additional comments received from Mr Allison, I conclude that an on-line option without any mitigation would not meet the NZTA resilience criteria. An in-ground retaining wall for Option Z would enable the resilience criteria to be met for an on-line option, however such a solution is anticipated to cost approximately \$112 million. Options around the existing alignment were considered but the geotechnical characteristics are similar and similarly costly solutions would be required to meet the resilience criteria. Mr Allison has considered costs of other options and is satisfied that NZTA's comments regarding the costs to mitigate the landslide appear reasonable. Noting that improved resilience is a key driver for the project, I can confirm I now accept the landslide at the northern end of the existing alignment to be bypassed to be a strong basis for the NZTA's selection of an offline option.

Weightings and Rankings in the MCA

3. Mr Doherty has provided a review of the statements of evidence of Mr McCombs, Mr Napier, Mr Boam, Mr Milliken, Mr Roan and Mr Symmans and this review is attached as **Appendix B**, dated 30 July 2018. I note a number of detail questions regarding the MCA were posed in the S92 letter and these were detailed in Appendix A, and summarised in paragraphs 107-109, of my S42A report. Having considered the NZTA evidence submitted, Mr Doherty's letter attached here as Appendix B details those matters which remain unaddressed.
4. In his evidence (assessment of alternative options: MCA processes) dated 25 May 2018, Mr Roan considers "*the alternatives assessment process has been robust, consistently applied between the longlist and shortlist stages, is transparent in the scoring given to options and the reasons for scoring, and was and is repeatable.*" With the issues Mr Doherty raises, this indicates that different experts may have scored alternatives

differently in this process, so I have reservations about the process being repeatable and reaching the same conclusions. However, I do accept, as stated in my report, relative to Section 171(1)(b), that adequate consideration has been given to alternatives.

5. Mr Doherty disagrees with Mr Milliken that the interaction of existing traffic with an online option would be very disruptive to the work being done and to road users – he considers the interactions can be managed to mitigate disruptions.
6. In paragraph 101 of my S42A report I discuss the relevance of costs to the assessment of alternatives, stating that matters of national importance are considered alongside cost matters under Part 2 of the RMA. The questions raised by Mr Doherty indicate that there are many cost variables (such as types of structures or earthworks, alignments and designing for a lesser operating speed), and in his view it remains difficult to understand the decision to select the proposed route over an online option. Mr Allison has also identified that engineering on the proposed route has the high potential to generate extra costs, and it is not clear whether such allowances have been considered in the costing of Option E. Mr Doherty has stated a number of (earlier raised) outstanding specific matters it would be helpful for NZTA to provide further comment on regarding constructability and transportation aspects of the MCA, to better understand the route selected.

Cultural considerations in the MCA

7. In paragraph 110 of my S42A report I suggested it would be helpful for Te Runanga o Ngāti Tama to clarify the relative cultural effects associated with an online route versus the proposed route. In my view, the NZTA response to the RFI (which stated that options affecting the peak of Mt Messenger were less desirable to Ngāti Tama) seemed at odds with the Ngāti Tama submission which stated that if the effects of the proposal could not be adequately addressed then an online option may be appropriate. In a recent discussion with Ngāti Tama I raised this question and was guided back to the cultural report appendices of Volume 4 of the application documents (Assessment of Alternatives), which stated that all options considered were fatally flawed in terms of cultural scorings provided by Ngāti Tama.

Further review of geotechnical information

8. Mr Allison has considered additional information submitted in evidence and in his letter dated 6 June (Appendix A) considers an assessment of liquefaction and cyclic softening of alluvial soils in low lying valleys. Mr Allison considers minimum standards are able to be achieved but notes that identified mitigation requirements will likely result in additional costs. He also notes that the design of rock cuttings and rock fall mitigation measures will provide a high level of safety and resilience from rock fall, but it is possible these measures will affect the cost of the project. There will be some residual risk due to the geotechnical nature of the area and the extent and nature of works proposed. I note that the NZTA revised suite of conditions includes my suggestion for engineering detail design to be subject to peer review.

Property access and state highway revocation

9. Paragraph 251 of my S42A report relates to property access and states that property access at the operational phase of the new road will be addressed via the revocation process. Since preparing my S42A report I have reflected further on the relevance and effect of this matter. I consider that, in the present circumstances, the revocation of the State Highway designation and State Highway status of the existing road is a potential

effect of the new designation, and therefore is a relevant consideration in the designation hearing and that it may not be appropriate to simply rely on the revocation process given the fact that this section of road is and would remain the primary (and in some instances the only) legal access for some landowners. I wish to alter my recommendation on this matter.

10. The Council Infrastructure Group anticipates that the road over Mt Messenger has high maintenance costs, and with there only being one dwelling (Beard) with sole access from that section of the State Highway, has reservations about being responsible for the old road if the State Highway status is revoked. Ngāti Tama as significant landowners are likely to have an interest in future status of the road, and there are a few other privately owned land parcels adjoining. The Council considers there are likely to be alternatives to explore alongside the option of transferring the land to the Council to manage as a local road, but accepts that it is not necessary to expedite the revocation process at this stage. Discussions to date with both Rob Napier and Andrew Gard of NZTA indicate that NZTA intends to consult with Council over the future status of the existing road. I consider it appropriate, given that the designation has a potential effect on Council and local landowners, to put specific measures in place through the decision on the NoR, should it be confirmed. Council in its infrastructure capacity seeks acknowledgement that access is an effect of the designation and notes that it seeks to enter into a process with the NZTA which will inform the final design and revocation process. In the present circumstances, I consider that access issues and the future status of the existing road is an effect to be considered.
11. Therefore, should the NoR be confirmed, I recommend that the NZTA and Commissioner consider conditions requiring consultation with the Council, Ngāti Tama, the Beards, and other affected landowners on options for management and control of the current road before any decision is made on the revocation or stopping of the road. Further, that NZTA undertakes to assist with any further works required to establish access to the Beard's land post revocation, and/or vest the road in the Beards as a private access way, or an alternative legal arrangement.

Tunnel

12. Relying on Mr Doherty's expertise I recommended a condition of consent in my S42A report requiring a 1.5m wide shoulder in the proposed new tunnel. I outlined the rationale for this in paragraphs 231 and 232 of my report. Mr Boam considers the shoulder width at paragraph 98 of his evidence (25 May 2018). In Mr Doherty's review of Mr Boam's evidence (attached as Appendix B) he states he does not agree that a shoulder width of 1.2m within the tunnel provides a safe environment for cyclists. With this matter in contention, I agree with Mr Doherty that an independent safety auditor should provide a formal view and recommend a condition be imposed in this regard.

Conditions to manage landscape, visual and natural character effects

13. Mr Bain has reviewed Mr Lister's evidence and the revised conditions, agrees with Mr Lister and is now satisfied that the revised conditions will deliver what is intended in the LEDF and ELMP with respect to landscape, natural character and visual effects. A letter provided by Mr Bain, dated 25/7/18 is attached as **Appendix C**.

NESCS resource consent

14. NZTAs evidence included a Detailed Site Investigation (DSI), therefore the conditions I recommended in my S42A report, which were on the basis of only a Preliminary Site

Investigation (PSI) having been carried out, are no longer relevant. I have had the DSI peer reviewed and comments from Sarah Knowles dated 20 July 2018 are attached as **Appendix D**. Ms Knowles considers the DSI is generally adequate for the purposes of the NESCS but some minor changes are required in order to be consistent with CLMG No.1. She also notes that earlier suggested changes to the CEMP and CLMP have not yet been incorporated. In terms of reporting, Ms Knowles states that given the long duration of the project staged reporting would be appropriate. I have forwarded Ms Knowles' comments to NZTA and Mr Roan has indicated NZTA intends to review the CLMP and CEMP in light of Ms Knowles' comments, and this is likely to be updated by the hearing.

15. My update to the NESCS aspect of the proposal is therefore that more information is now available to inform soil management, with testing having been carried out, however the Council is not yet satisfied that the DSI and approach proposed is in accordance with CLMG No.1. If the consent is granted, the conditions now proposed (as at 17 July 2018) are considered adequate, subject to the DSI, CLMP and CEMP being updated in accordance with Ms Knowles' comments.

Ecological effects

16. Since finalising my S42A report, Wildlands' ecologists have taken part in a number of teleconferences with NZTA ecologists in an attempt to resolve earlier identified issues (detailed in their earlier reviews (Appendix F of the S42A report) and summarised in my S42A report). These discussions have been very technical in nature and minutes were agreed following the discussions. Some agreements have been reached and Wildlands anticipated that a number of changes would be made to the ELMP; this has occurred to some extent however several expected revisions have not been carried through to the ELMP. Wildlands have provided a further review of the revised ELMP (submitted as Supplementary Evidence on 17 July 2018), and the latest Wildlands review is attached as **Appendix E**.
17. Wildlands still have concerns about a range of matters relevant to the assessment of ecological effects and the ELMP including, but not limited to, the understatement of ecological values within the project footprint, high value ecological areas not being mapped as such in the ecology constraints mapping (Appendix A, ELMP), anticipated net loss of indigenous vegetation and habitats, the nature and extent of mitigation planting, significant and emergent trees, edge effects, and performance measures.
18. Significant concerns are expressed by Wildlands regarding the revised provisions for managing construction effects on bats. Wildlands do not support the revised vegetation clearance protocols in the ELMP which they consider will greatly reduce the earlier proposed protections for Threatened-Nationally Critically long-tail bats; it is considered the approach now proposed will expose long-tailed bats to risk of injury or death due to tree felling because the majority of vegetation would be excluded from any surveys for the presence of bats. Wildlands are concerned that NZTA no longer intends to adhere to DOC's best practice manual of conservation techniques for bats, and the proposed Vegetation Removal Protocol does not follow the NZTA guidelines around vegetation removal. The proposed Vegetation Removal Protocol included in the current version of the ELMP no longer has the transparency that the earlier draft ELMP had in terms of DOC and Council ecologists inputting to decisions to remove vegetation where there is a risk to this critically threatened species. The current wording suggests that there is no longer the requirement to discuss methods to progress vegetation

removal when there is an active roost (i.e. a roost with bats present) that requires removal with a wider panel of experts than are directly employed on the project. An earlier version provided for a wider decision to be made either a DOC representative or a Council nominated representative to make the final decision upon the course of action in this situation.

19. In terms of avifauna, Wildlands are concerned about the lack of a plan to protect nesting kokako and/or kokako if these establish a territory within the area to be cleared.
20. The herpetofauna management plan now includes indigenous frogs. Wildlands report that there is now a clearer definition of what constitutes high value lizard habitat and the ELMP now better addresses vegetation versus corresponding fauna habitat values. However, the revised ELMP has reduced effort spent on locating geckos during nocturnal searches, with no explanation. Similarly, the removal of other herpetofauna management measures are unexplained and Wildlands make additional suggestions to reduce adverse effects on herpetofauna.
21. Regarding freshwater ecology, Wildlands are satisfied with the measures proposed for fish passage and the timing of works, and riparian restoration planting performance measures. However, some further details are recommended for the ELMP, including specifying the time of the year earthworks may take place near the swamp forest. The availability of stream restoration locations remains unconfirmed.
22. Regarding the management of invertebrates, Wildlands' concerns relating to aquatic macroinvertebrate monitoring or peripatus have been addressed, however Wildlands maintain that targeted surveys of Lepidoptera, including forest ringlet butterfly (conservation status 'At Risk') should be undertaken.
23. Wildlands note the increase in size of the Pest Management Area (PMA) from 1085 hectares in the draft ELMP to 3650 hectares in the revised ELMP, and state "*This change is primarily to increase the likelihood that the pest control results in an increasing population of long-tailed bat. This is a substantial increase in area, and if effectively managed in perpetuity, will result in greater, long-term gains for both vegetation and fauna than the area originally proposed.*" However, Wildlands note that "*it is unclear whether targets set will be adequate to protect bats*". This is because a 10% RTI (Rat Tracking Index) has been set as a threshold for success, and "*predator control that benefited bats in the Eglinton Valley reduced rat numbers to an equivalent of 5% RTP*". Control also needs to be targeted to reduce numbers during a time of year that best protects bats, and this is not defined by the Applicant.
24. Regarding the PMA, Wildlands raise the issues of:
 - uncertainty regarding the area proposed for pest management
 - duration and scope of monitoring of forest birds in the PMA
 - detail relating to the pest animal exclusion pen which is part of a compensation and mitigation package to address effects on indigenous lizards
 - a lack of evidence to support the pest control outcomes claimed for bats, the level of control to be achieved, and the timing of control pulses
 - that provisions for wasp management may be inadequate
 - a lack of clarity regarding the financial mechanisms that will be put in place to ensure ongoing availability of funds for pest control in perpetuity.

25. Wildlands remain unconvinced that the pest management approach would meet stated mitigation outcomes and that the proposed mitigation and offsets package would mitigate or offset adverse ecological effects. They recommend a number of revisions to the ELMP and proposed designation conditions. I note that the expert ecological evidence lodged by DOC and Ngāti Tama also outline revisions to the ELMP for consideration.

Management Plans and Conditions

26. In my S42A report I noted reservations regarding the proposed approach by the NZTA where the Council would not have a certifying role for management plans, particularly with the lack of an Outline Plan process. I am pleased to see that the revised conditions allow for an Outline Plan process, and the management plans and conditions now have increased certainty regarding performance outcomes and other details (although as is evident from the above comments I still have concerns regarding the detail contained in some management plans, and the measures proposed. Although performance standards are now stated, the proposed mitigation/offset/compensation measures remain subject of contention).
27. Having discussed the suggested lack of certification process with Mr Roan at some length, I have a greater appreciation of the intent of process and the reasons for it, and I am now of the opinion that should the decision be made to confirm the NOR, where the management plans are such that the Council is satisfied with their content, the conditions proposed are satisfactory for allowing for Council input to any changes to the management plans – that is there would not be any need to be a further certification or approval stage for management plans. However, in my view the current revisions of the ELMP, CEMP and CLMP are not ready to be approved as final, therefore the certification of these by Council is still recommended, should the NOR be confirmed.

Preparatory works

28. I do not agree with NZTAs provisions in the proposed conditions relating to preparatory works. Given the scale of the effects of the project, I consider it appropriate and sensible to consider the effects of the project as a whole and it would be inappropriate to separate the permitted activities from the aspects of work requiring approval. In my view, once preparatory works begin the project should be deemed to be commence in accordance with all provisions of the CEMP and conditions, and it would be inappropriate to carry out preparatory works prior to decisions being made on the NOR, including the potential for any unresolved appeal on the decision.

Conclusion

29. It remains my view, as stated in paragraph 383 of my S42A report, that a principal effects issue in contention is associated with the extent and details of the proposed ecological mitigation and offset package. Evidence anticipated to be presented at the hearing relating to cultural effects also needs to be heard before I may be in the position to recommend confirmation of the NOR.



Rachelle McBeth
Senior Environmental Planner
New Plymouth District Council
30 July 2018

APPENDIX A: Comments from Russell Allison (AECOM Associate Director - Ground Engineering & Tunnelling) dated 6 And 18 June 2018

6 June 2018

Rachelle McBeth
Senior Environmental Planner - Consents
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Dear Rachelle

**SH3 Mt Messenger Bypass
Response to Applicant's additional information and evidence**

I have read the Applicant's additional information and statements of evidence listed below and provide the following comments:

- Liquefaction and Cyclic Softening Assessment Summary Report dated 25 May 2018 (Ref MMA-DES-GEO-E1-RPT-4113)

The report summarises the findings of a liquefaction and cyclic softening assessment of alluvial soils in the low lying valleys of the Mangapepeke Stream and Mimi River and has been based on the geotechnical investigations completed to date. These investigations include CPT's, machine drilled boreholes, test pits, laboratory testing and groundwater monitoring that has been completed since the earlier Opus geotechnical factual report and includes the locations where the main embankments cross potentially liquefiable soils.

The assessment has been carried out in accordance with current best practice and concludes that the alluvial soils are generally cohesive and not considered to be susceptible to widespread liquefaction. However, there are pockets of liquefiable soils and soft soils that may liquefy or be subject to cyclic softening during 1/100 to 1/500 year earthquake events.

The consequence of liquefaction and cyclic softening and the effects on structures is presented in Tables 7.1 and 7.2 of the report and mitigation is presented in Table 8.1. I consider the proposed ground improvement measures and further assessment at detailed design stage will allow the structures to meet the project Minimum Standards. There is a risk that any identified mitigation requirements will result in additional costs.

- Statement of evidence of Bruce Symmans (Geotechnical Matters)

With reference to the numbered items as per the evidence of Bruce Symmans, I make the following comments:

1 to 6 Noted

7 to 9 Noted

10 Agree. The results of the inclinometer monitoring prepared by Geotechnics Limited and dated 28 May 2018 indicate lateral displacements of between approximately 25mm and 40mm in BH103 and BH105 at 23m and 24m depth respectively. In addition the dummy probe could not pass below 14.5m and 8.5m in BH104 and BH106 respectively, indicating significant displacement of the inclinometer tube at these depths.

11 Given the high cost of the retaining structures along Option Z was there any consideration given to making changes to the Option Z alignment in the vicinity of the landslide? Based on the findings of the engineering geological mapping and inclinometer readings it would appear that the depth to the basal shear surface of the landslide would reduce to the east. Therefore an alignment coincident with or immediately to the east of the existing SH3 alignment would expect to require a shallower retaining structure and therefore lower cost.

I note that in Item 77 of the evidence of Mr Roan he states that refinements to the alignment were considered, however no refinement was identified that would either avoid the landslide or meet the Transport Agency's engineering requirements.

12 to 15 Agree

16 to 28 Noted

29 to 31 Agree, although it appears significant geotechnical information has been gathered after MCA2 and after submission of the AEE in December 2017. Based on the geotechnical information received after submission of the AEE, has the estimated cost of the Project alignment or Option Z been revised, and if so, are there any significant changes?

32 to 41 Noted and I agree that the design approach is in line with standard practice.

42 to 44 I would clarify that I was only suggesting the design speed is relaxed to enable greater flexibility in alignment options in the vicinity of the landslide. I note that in the evidence submitted by Mr Boam, under item 53, he states the safe operating speed of Option Z7 was 70 kph.

45 Noted

46(a) What were the findings of the review of the NOC TREIS Report 2017? Has the existing section of SH3 that traverses the landslide been subject to on-going maintenance and if so what has been done? Note that we requested the maintenance records for the existing section of SH3 that traverses the landslide and were advised by Mr Roan that they do not really consider it to be a relevant consideration (email dated 4 May 2018). I disagree and consider the past performance of the existing section of SH3 to be relevant to any on-line route options that traverse the landslide.

46(b) to 55 Noted

56 Has the stability of the existing section of SH3 that traverses the landslide been assessed and what are the outcomes with regard to resilience?

57 to 63 Noted

64 As discussed in 11 above, was consideration given to an alignment coincident or immediately east of the existing SH3 that would result in shorter piles and therefore reduced cost?

65 to 69 Noted

70 and 71 Agree

72 to 75 I would clarify that I was proposing the MSE structure would be founded on the piled retaining structure. I agree that simply adding an MSE structure on top of the landslide would have a destabilising effect.

76 to 78 Noted, although much of the geotechnical information on the landslide appears to have been available after the options assessment process was complete and after submission of the AEE.

79 and 80 How frequently has the existing section of SH3 that traverses the landslide been repaired?

81 to 104 Noted

105(b) This is a change from the design approach proposed in the AEE where the use of rock drapes is included for all cuttings greater than 20m in height (the majority). The removal of rock drapes and re-profiling of the slope would significantly increase the volume of soil and rock to be

excavated, with resultant increases in cost. The top of the slope would be displaced horizontally by approximately 3.3m so it is unlikely to result in the cuttings extending beyond the proposed designation, unless a significantly wider verge is also required. However, the increase in volume of excavated material could require additional disposal areas or extensions to the proposed disposal areas.

106 to 110 Noted

111 Have the field rock fall trials been carried out yet? Do they confirm the proposed 2(v):1(h) slope profile will meet the rock fall resilience requirements without the use of rock drapes and that the Project can still be constructed within the proposed designation?

112 to 121 Noted

122 to 125 I agree that the proposed design of rock cuttings and rock fall mitigation measures will provide a high level of safety and resilience from rock fall, provided the design adequately addresses the proposed reduction in the use of rock drapes for the high slopes. It is unclear how these proposed changes in design will effect the cost of the Project.

126 to 140 Since my initial review and comments regarding liquefaction potential there have been additional investigations and an assessment carried out, the findings of which have been presented in the report referenced above. Based on the findings of the report, I agree that the alluvial soils are unlikely to present a significant liquefaction hazard to the Project.

141 to 157 Noted.

158 to 162 I agree that experienced contractors should be able to optimise the re-use of the material for fill. I would recommend that sufficient contingencies should be included for the use of additional lime and cement to dry the materials during periods of prolonged damp/wet weather.

163 to 178 Noted

179 to 181 Agree

Yours sincerely



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18 June 2018

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Dear Rachelle

**SH3 Mt Messenger Bypass
Response to Applicant's additional information and meeting 11/06/18**

Following my letter dated 6 June I attended a meeting with Bruce Symmans and two members of his geotechnical team at the Alliance offices in Wellington on 11 June 2018. The purpose of the meeting was to discuss a number of items that I raised in my letter dated 6 June, particularly in regards to the assessment of route options across the landslide. I have listed these items below and my comments based on discussions that took place at the meeting.

11 Given the high cost of the retaining structures along Option Z was there any consideration given to making changes to the Option Z alignment in the vicinity of the landslide? Based on the findings of the engineering geological mapping and inclinometer readings it would appear that the depth to the basal shear surface of the landslide would reduce to the east. Therefore an alignment coincident with or immediately to the east of the existing SH3 alignment would expect to require a shallower retaining structure and therefore lower cost.

I note that in Item 77 of the evidence of Mr Roan he states that refinements to the alignment were considered, however no refinement was identified that would either avoid the landslide or meet the Transport Agency's engineering requirements.

The Alliance considered options to the east of the existing SH3 alignment but a satisfactory vertical alignment could not be achieved. The stability of the existing SH3 alignment across the landslip is indicated to be marginal and therefore any widening options would not meet the project objective of improved resilience without appropriate engineering. Based on the ground model developed by the Alliance, the depth to the shear surface does not appear to reduce significantly in the vicinity of the existing SH3 and therefore an in ground structure similar to that proposed for Option Z is likely to be required for any on-line option. Hence costs for any on-line option that crosses the landslide and is required to meet the improved resilience criteria are likely to be similar to that for Option Z.

29 to 31 Agree, although it appears significant geotechnical information has been gathered after MCA2 and after submission of the AEE in December 2017. Based on the geotechnical information received after submission of the AEE, has the estimated cost of the Project alignment or Option Z been revised, and if so, are there any significant changes?

On leaving the meeting, Bruce Symmans confirmed that the Alliance are currently revising the estimated cost of the proposed alignment based on the additional information made available after submission of the AEE. He stated that cost was still a project risk but he did not anticipate the revised estimate would vary significantly from that previously submitted.

46(a) What were the findings of the review of the NOC TREIS Report 2017? Has the existing section of SH3 that traverses the landslide been subject to on-going maintenance and if so what has been done? Note that we requested the maintenance records for the existing section of SH3 that traverses the landslide and were advised by Mr Roan that they do not really consider it to be a relevant consideration (email dated 4 May 2018). I disagree and consider the past performance of the existing section of SH3 to be relevant to any on-line route options that traverse the landslide.

The Alliance have reviewed aerial photos that indicate the carriageway has been re-aligned on several occasions and that creep is starting to occur on the shoulders of the fill embankments crossing the head scarp of the landslide. The results of the inclinometer readings indicate the southern part of the landslide is active and displacement of the road embankments is likely to continue / increase in the future.

56 Has the stability of the existing section of SH3 that traverses the landslide been assessed and what are the outcomes with regard to resilience?

The Alliance have assessed the stability of the existing SH3 and it is marginal and would not meet the project objectives of improved resilience without suitable engineering.

64 As discussed in 11 above, was consideration given to an alignment coincident or immediately east of the existing SH3 that would result in shorter piles and therefore reduced cost?

See response to 11 above.

79 and 80 How frequently has the existing section of SH3 that traverses the landslide been repaired?

The Alliance indicated it has been repaired a number of times.

105(b) This is a change from the design approach proposed in the AEE where the use of rock drapes is included for all cuttings greater than 20m in height (the majority). The removal of rock drapes and re-profiling of the slope would significantly increase the volume of soil and rock to be excavated, with resultant increases in cost. The top of the slope would be displaced horizontally by approximately 3.3m so it is unlikely to result in the cuttings extending beyond the proposed designation, unless a significantly wider verge is also required. However, the increase in volume of excavated material could require additional disposal areas or extensions to the proposed disposal areas.

The increase in volume from the potential re-grading of the cut batters was indicated to be small and would likely be accommodating in raising the base of the cuts and the height of the embankments. No additional fill sites are anticipated.

111 Have the field rock fall trials been carried out yet? Do they confirm the proposed 2(v):1(h) slope profile will meet the rock fall resilience requirements without the use of rock drapes and that the Project can still be constructed within the proposed designation?

Rock fall trials are planned for w/c 18 June, weather permitting.

Yours sincerely



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APPENDIX B: Comments from Graeme Doherty (AECOM Manager - Civil Infrastructure dated 30 July 2018

30 July 2018

Rachelle McBeth
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Dear Rachelle

**SH3 Mt Messenger Bypass
Peer Review of the Notice of Requirement for Resource Consent
Review of Statements of Evidence**

I, Graeme Keith Doherty, CPEng, ME (Transp), NZCE (Civil), CMENZ, at the request of New Plymouth District Council (NPDC), have undertaken a review of the following statements of evidence, which form part of the Resource Consent application by the New Zealand Transport Agency for a designation for a new state highway route in the location known as Mt Messenger in North Taranaki.

- Peter Terence McCombs (Traffic and Transport);
- Robert Craig Napier (Transport Agency Project Manager);
- Kenneth John Boam (Project Design);
- Hugh John Milliken (Project Construction);
- Peter Anthony Roan (Assessment of Alternative options: MCA Process)
- Bruce Symmans (Geotechnical Matters) – Option Z retaining wall costs and Appendix 2 only;

The following are my comments from my review. Numbering is correlated to the numbering within each statement of evidence

Peter Terence McCombs

Under the "Section 42A Report" heading, it is noted that clarification or explanation has not been provided on the matter of shoulder widths, which I address on page 2 (my response to para 98 of Mr Boam's evidence). It would be helpful if Mr McComb could explain how the proposed carriageway configuration with a shoulder of 1.2m satisfies the Transport Agency's functional requirements of operation, safety and maintenance.

Robert Craig Napier

Under the "Section 42A Report" heading, it is noted that clarification or explanation has not been provided on the matter of shoulder widths, which I address on page 2 (my response to para 98 of Mr Boam's evidence). It would be helpful if Napier could explain how the proposed carriageway configuration with a shoulder of 1.2m satisfies the Transport Agency's functional requirements of operation, safety and maintenance

Kenneth John Boam

28. It would be helpful if Mr Boam could explain why a 100km/h operating speed was chosen and not a lesser operating speed?

With reference to Table 4.1 of the AEE, it would be helpful if Mr Boam could explain whether designing a new route for an operating speed of 70 or 80 km/h would achieve the objectives of the project? Mr Boam should also be asked whether, by adopting a lower operating speed, the overall cost of construction would be reduced.

51. It is stated that Option Z2 had an operating speed of 70kph and it is also stated that it has an operating speed of 100kph. It would be helpful if Mr Boam could clarify.

52 and 53. It is stated that the option called Z7 was considered. I could find no mention of Option Z7 in Technical Report 2, Volume 4A, nor the AEE. Mention is made of Option Z7 in some of the appendices in Volume 4B but the MCA was undertaken on Options Z2 and Z4. It would be helpful if Mr Boam could explain what Option 7 is and its relevance to the project.

83. It would be helpful if Mr Boam could clarify the meaning of "without encountering trucks" within the context of this paragraph. Clarification as to travel time savings for light vehicles of 4.05 minutes is also sought when cross referenced to Mr McCombs evidence of 3.9 minutes savings (Paragraph 122.b).

98. I do not agree that a shoulder width of 1.2m within the tunnel provides a safe environment for cyclists. The presence of solid side protection barriers and the escape tunnel is likely to mean that cyclists will shy away from these obstacles and track to the far right of the shoulder. Being a 100kph environment, the airflow generated by vehicles, particularly heavy vehicles, is likely to cause cyclists to swerve, possibly into the traffic lane. I recommend that an independent safety auditor provide a formal view of the safe width of the tunnel shoulders for cyclists, whilst having regard to Austroads requirements (Table 4.5 from Austroads Part 3) and the PIARC guidelines, which I address below.

225. It would be helpful if Mr Boam could explain why a shoulder width of 1.2m wide within the tunnel has been adopted when correlating the PIARC guidelines (either less than 1.0m or greater than 2.0m) with Austroads standards (total shoulder width of 2.0m for AADT of 1000-3000) and why, having given regard to that correlation, a minimum shoulder width of 2.0m was not adopted?.

Hugh John Milliken

106. It would be helpful if Mr Milliken could explain if the cost of the retaining wall would change if the height of the retaining wall was reduced through a change in the vertical alignment to a lower design speed.

108; 113.Fig.14; 115.c;

I don't agree with Mr Milliken that "the interaction of existing traffic with an online option would be very disruptive to both the work being done and to road users." I agree that it would be somewhat disruptive but this has to be taken in context with the 2700 vpd and the quantum of interactions between the works and existing traffic. For example, previous work on Mt Messenger has utilised a window of time for the road to be open each day, from which road users can manage their travel and provides a long window for construction activities to occur each day. In my opinion the interactions can be managed to mitigate any disruption.

110. The bridges in option Z are of similar lengths to the bridges in Option E. It would be helpful if Mr Milliken could provide further detail as to why bridges and bridge abutments in close proximity to existing roads increases cost?

The MCA2 figures shown in Appendix B, which is within Appendix B of Volume 4B shows an embankment at the southern end of option Z (approximately 1km north of the southern tie in point). The drawing from Mr Symmans' evidence (Appendix 2) shows a bridge at the same location. Assuming that Mr Milliken's evidence is aligned to Volume 4B, it would be helpful if Mr Milliken could advise whether a bridge at that location would decrease the construction challenges and/or construction costs.

110.Fig 9. This figures shows a bridge pier within the existing road. It is my opinion that a bridge designer could design the bridge to ensure that a pier or other obstruction did not reside within the existing road. It would be helpful if Mr Milliken could confirm my opinion.

110.Figs 8 & 10; 113.Fig.13; 113.Fig.15;

These figures show a bridge directly to the south of the southern tunnel portal. This is different from the information provided in Mr Symmans' evidence (Appendix 2), which shows a fill embankment. It would be helpful if Mr Milliken could explain this difference and whether he thinks a fill embankment at that location would decrease the construction challenges and/or construction costs.

115.f It would be helpful if Mr Milliken could quantify the programme duration for Option Z, correlated to the interactions with traffic and the overall quantum of earth to be moved by road trucks, and advise whether the overall programme would result in a longer or shorter programme compared to Option E.

It would be helpful if Mr Milliken could explain why increased numbers of road trucks, which are a standard vehicle on the state highway network, will lead to a detrimental impact on the existing road surface.

Peter Anthony Roan

70.d. It would be helpful if Mr Roan could explain why Option Z2, with a design speed of 70 km/hr, was not one of the options under consideration within the shortlist of options as it was the best performing option from the longlist of options considered (Volume 4A) and a lower cost than Option Z4?

79. It would be helpful if Mr Roan could provide the current estimated outturn costs for option E, including all property purchase, compensation and accommodation costs, environmental compensation costs and construction costs to understand whether Option E is still the lowest cost option?

90. It would be helpful if Mr Napier could provide the rationale about why the Transport Agency, having given regard to the MCA process and cost, chose option E? In making that decision, it would be helpful if Mr Napier could clarify whether the Transport Agency considered cost as the primary criteria?

91. With reference to the constructability criteria (Sections 3.3 and 4 of Appendix C of Volume 4B) and the transport criteria (Sections 3.4 and 4 of Appendix D of Volume 4B), noting that the effects on traffic during construction have been assessed twice and noting the scoring of Option Z relative to Option E, has the assessment process over-calculated and over-emphasised the constructability challenges of Option Z, and has this inadvertently affected the decision making process in choosing Option E?

With reference Section 3.2 of Appendix D of Volume 4B, noting that the travel time savings, and the scoring thereof, is related to a distance of 21km (between Tongaporutu and Uriti) as opposed to the 7.4km of the Mt Messenger project length, has the assessment process under-stated the score for travel time savings of Option Z, and has this inadvertently affected the decision making process in choosing Option E?

Bruce Symmans

66. It would be helpful if Mr Symmans could advise if the cost of the retaining wall would change if the height of the retaining wall above ground level was reduced and to quantify the change in cost per metre height reduction.

The drawing of Option Z, provided by Mr Symmans (Appendix 2), shows a fill embankment directly to the south of the southern portal of the tunnel. This is at odds with the evidence provided by Mr Milliken (paras. 110.Fig.10 and 113.Fig.13) and the drawings and sketches shown in Volume 4B of the application documents. It would be helpful if Mr Symmans could explain this difference and whether he considers an earth embankment could be built at this location.

The drawing of Option Z, provided by Mr Symmans (Appendix 2), shows a bridge near the southern end of the option, approximately 1 km north of the southern tie in point. This is at odds with the evidence provided in Volume 4B of the application documents. . It would be helpful if Mr Symmans could explain this difference and whether he considers an earth embankment is buildable at this location and whether it would be less cost to build than a bridge.

Yours sincerely



Graeme Doherty

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**APPENDIX C: Comments from Richard Bain (BlueMarble – Landscape Architect)
dated 25 July 2018**

bluemarble
A world of difference



25/7/18

richard@bluemarble.co.nz
+64 6 7578903

To: Rachelle McBeth

4/34 Egmont Street,
New Plymouth, 4310

RE: MOUNT MESSENGER BYPASS - LANDSCAPE MATTERS

Please find my comments below in regard to the following documents:

**STATEMENT OF EVIDENCE OF GAVIN CRAIG LISTER
(LANDSCAPE, NATURAL CHARACTER, AND VISUAL) ON BEHALF OF THE NZ TRANSPORT AGENCY
25 MAY 2018**

I have read Mr Lister's evidence and consider that it is consistent with the Project application and s92 response documents that pertain to landscape, natural character, and visual impacts.

EXECUTIVE SUMMARY

Mr Lister acknowledges that the Project is likely to have adverse landscape, visual and natural character effects, but considers that the Project avoids, and minimises potential effects, through alignment, a tunnel, box cuttings, limited visibility.

I agree.

Mr Lister acknowledges that the Project will necessitate considerable earthworks, bush clearance, stream diversions, and introduction of infrastructure into a natural valley, but considers that the Project avoids, and minimises potential effects, through offset planting, minimising encroachment of significant trees, naturalisation of stream diversion, appropriate cut and fill batters, revegetation, and contouring.

I agree.

BACKGROUND AND ROLE

Mr Lister outlines his role and correctly references previous Project documents relevant to landscape, natural character, and visual assessment.

Mr Lister has visited the site.

SCOPE OF EVIDENCE

Mr Lister lists the scope of his evidence, noting that it should be read in conjunction with earlier technical reports.

In my opinion the Scope of Evidence is appropriate for the Project.

METHODOLOGY

Mr Lister outlines the methodology used to assess landscape, natural character, and visual effects.

His description is consistent with the assessment methodology undertaken in the Project Application, including reference to relevant statutory and policy documents.

EXISTING LANDSCAPE, NATURAL CHARACTER AND VISUAL ENVIRONMENT

Mr Lister describes the Project's landscape, dividing it into three areas - Mangapepeke Stream Valley, Main ridge, and Mimi River Valley. He also describes the wider setting.

Mr Lister's descriptions are consistent with those of the application documents, and consistent with my own knowledge of the area.

LANDSCAPE, VISUAL, AND NATURAL CHARACTER EFFECTS

Mr Lister addresses effects under four main headings. These are:

Mangapepeke Stream Valley

Mr Lister describes the route and its effects noting the adverse effects will arise from loss of bush and streams, and the visual impacts of the highway including cut batters.

Mr Lister's descriptions and assessments are consistent with the Landscape and Environment Design Framework (LEDF), that comprised Technical Report 8a.

In para 41(c), Mr Lister states that the Project will have high adverse effects on the natural character of the upper Mangapepeke Stream. He goes on to say that any assessment of the Mangapepeke Stream should be considered within the context of the whole valley.

I agree.

Mimi River Valley

Mr Lister describes the route as it climbs from the Mimi Valley via a bridge to the tunnel.

Mr Lister states that adverse effects arise from the loss of natural landscape features (bush and streams), and the visual impact of the highway. He notes that the most substantial disruption to natural patterns and processes will be large embankment fill on the tunnel portals. He states that this will be visually contained by spurs and surrounding bush.

His overall assessment is that the Project will have little adverse visual effect on the broader Mimi Valley. Mr Lister lists three main reasons for his assessment - clauses 46(a)-(c).

I agree.

Temporary Landscape and Visual Effects

Mr Lister states that the Project will take three years to construct, noting that construction effects will be typical of projects such as this and that there are only 3 houses in the area that will be affected by construction effects.

I agree.

Overall landscape, visual and natural character effects

Mr Lister notes that this project has increased effects created by the steep, dissected, bush covered nature of the site. He considers that these effects are avoided and minimised through alignment, the tunnel, and detail features such as box cuttings. He states that the project will have low visibility.

I agree.

ADDRESSING POTENTIAL ADVERSE LANDSCAPE AND VISUAL, AND NATURAL CHARACTER EFFECTS

This section of Mr Lister's evidence states that addressing potential adverse effects fall into three tiers - choice of route, alignment and tunnel, mitigation and enhancement measures.

I agree that the chosen route is the best from a landscape perspective. Mr Lister discusses the alternative route options and I agree with his assessment.

I also agree that the tunnel offers a good landscape outcome by way of a lower elevation across the route. In particular I agree that the tunnel maintains the integrity of the main ridge.

Mr Lister states that the mitigation measures are described in the Landscape and Environment Design Framework (LEDF) and Ecology and Landscape Management Plan (ELMP). He states that the ELMP provides specific detail in relation to restoration and rehabilitation of natural systems, whereas the LEDF is a living document to guide detailed design. He goes on to describe the mitigation measures such as offset restoration planting, naturalisation of stream diversions, retention of significant trees and vegetation, cut batters, fill batters, surplus fill, bridge design, highway furniture, cycling, pull off places and access to bush, and cultural expression.

These measures as described by Mr Lister are consistent with the LEDF and ELMP documents.

Conditions - Para 70,71

Mr Lister states that Condition 1 (a) requires that the Project be undertaken in general accordance with the application documents, the hearing evidence and management plans. He notes that the applicant documents induces the LEDF and Drawings Package. He goes on to state the LEDF and ELMP provide sufficient certainty to enable effects to be properly assessed and detail design to be refined.

I agree with Mr Lister's statement that the if the Project is implemented in accordance with the LEDF, ELMP and drawings package, the landscape and visual effects will be 'moderate-low', and be 'moderate' for natural character.

RESPONSE TO SUBMISSION AND NPDC SECTION 42A REPORT

Submissions

Mr Lister outlines submissions noting that DOC agree with the proposed route but consider that the conditions are inadequate.

With regard to landscape, visual effects, and natural character effects (my area of expertise - I am not commenting on ecology), I agree with Mr Lister's opinion that effects can be mitigated as described.

I agree with Mr Lister's view that the tunnel avoids landscape effects.

Section 42A Report

Mr Lister addresses my Section 42A concerns re Conditions.

He suggests that there is confusion over the role of the ELMP due partly to its name. He suggests that a better name, considering its contents, would be 'Ecology and Revegetation Management Plan'.

I agree with this.

Mr Lister goes on to outline the role of the LEDF and that it is intended to inform detailed design.

I agree that this is the intention of the LEDF but in my 42A comments I was seeking certainty that this would occur. Mr Lister agrees that beefing up condition 6 will give greater effect to the LEDF.

However, in paras 79 and 80, Mr Lister suggests that the NPDC recommended condition 32 goes too far in its specific list and provides reasons why. He is happy with the first sentence that states that "*the Requiring Authority shall ensure that the LEDF full informs detailed design*".

I accept Mr Lister's rationale that specific reference to aspect of the LEDF may undermine its role.

Mr Lister agrees that a simplified recommended Condition 38 will provide additional certainty that the LEDF will inform detail design on an ongoing basis as an umbrella document.

I am happy with Mr Lister's recommendation with regard to Conditions 38 and 32.

DESIGNATION & RESOURCE CONSENT CONDITIONS - 17 JULY 2018

I have reviewed the Conditions and make the following comments:

The ELMP is called the Ecology and Landscape Management Plan. Mr Lister in his evidence suggests that this document would be better named as 'Ecology and Revegetation Management Plan (ERMP)'.
I agree with Mr Lister.

I agree with reworded 1(a) that includes "*the drawing set...*" as this embeds the ELMP into the Condition.

Condition 25 is not amended as per Mr Lister's recommendation para 79. (He refers to this as Condition 32).

I am relaxed either way as to whether the condition is listed as is or should be modified as per Mr Lister's evidence, but I think he makes a good point that the list may misconstrued.

Condition 26 addresses Mr Lister's recommendation in his para 81. (He refers to it as Condition 38)

I agree with this new Condition.

Mr Lister suggests that 25 and 26 (he refers to them as 32 and 38) should be combined. It has not been combined. I am relaxed either way.

There are other references to the LEDF in the conditions which reassure me that it is imbedded into the Project delivery.

Richard Bain

Landscape Architect



APPENDIX D: Comments from Sarah Knowles (AECOM, Associate Director – Environment) dated 20 July 2018

20 July 2018

Rachelle McBeth, Senior Environmental Planner - Consents
New Plymouth District Council
Liardet St, Private Bag 2025
New Plymouth 4342

Dear Rachelle

Mt Messenger Alliance, Ground Contamination - Detailed Site Investigation

1.0 Introduction and Background

AECOM New Zealand Limited (AECOM) has been engaged by New Plymouth District Council (NPDC) to undertake a technical peer review of the land use consent application by NZ Transport Agency (NZTA) for improvements to the Mount Messenger section of SH3 (the Project).

The advice contained in this letter relates solely to the assessment of hazardous substances, contaminated land issues and the relevant resource consent status under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (referred to here as the NES-CS).

AECOM has previously reviewed the following documents and provided comment in a letter dated 3 May 2018 for contaminated land issues and in a letter dated 9 May 2018 for hazardous substances issues:

- *Mt Messenger Bypass, Assessment of Effects on the Environment*, dated December 2017; submitted by the Mt Messenger Alliance (the AEE).

The application incorporated the following:

- *Ground Contamination - Preliminary Site Investigation, Mt Messenger Alliance Technical Report 12* dated December 2017 (the PSI), prepared by Tonkin & Taylor Limited (T&T); and
- *Draft Construction Environmental Management Plan* dated December 2017 (the draft CEMP), prepared by the Mt Messenger Alliance.

This letter documents the review of the following provided as part of the applicant's evidence:

- *Ground Contamination - Detailed Site Investigation, Mt Messenger Alliance* dated March 2018 (the DSI), prepared by the Mt Messenger Alliance; and
- *Construction Environmental Management Plan* dated May 2018 (the CEMP), prepared by the Mt Messenger Alliance.

2.0 The Proposed Activity

The Project comprises a two lane highway, approximately 6 kilometres (km) in length, located to the east of the existing SH3 alignment. The Project is anticipated to take four years to construct.

According to Section 5.13 of the AEE approximately 960,000 m³ of excavated (cut) material will be generated from the Project. Of this, 890,000 m³ is to be placed in fill embankments on-site and an excess of approximately 70,000 m³ structural fill will be disposed of within the designation boundaries either in spoil disposal site or embankments. A further 75,000 m³ of unsuitable material is expected and will likely be disposed in spoil disposal sites.

Two spoil disposal sites are proposed in the southern construction regional where earthworks will generate surplus material. Spoil disposal sites have also been identified in the northern construction region. These spoil disposal sites could be used for the permanent placement of spoil, temporary storage of topsoil, for spoil stockpiling on-site until alternative fill sites become available or for spoil conditioning.

Section 9.15.4 of the AEE states that the following potential activities which could have resulted in ground contamination along the Project alignment:

- Fly tipping along parts of existing SH3;
- Waste disposal to land associated with potential farm dumps at the northern and southern ends of the proposed alignment;
- Storage of fuels, chemical and wastes associated with farming operation;
- Possible structures containing asbestos containing materials (ACM); and
- Spills along existing SH3 where accidents have happened.

The PSI provided an NES-CS assessment and indicated that the activity is disturbing soil and changing the use of the land. It was assessed that the volume of soil requiring removal for the Project is unlikely to meet the provisions of a Permitted Activity under the Regulation 8 (3). In the absence of a DSI the soil disturbance would be a Discretionary Activity under Regulation 11. The change in use of land was assessed to meet the provisions of a Permitted Activity under regulation 8(4). AECOM concurred with this assessment of the activities under the NES-CS.

3.0 Document Review and Commentary

3.1 Detailed Site Investigation

AECOM have reviewed the DSI report and make the following comments (refer Table 1). The DSI is generally considered adequate for the purposes of the NES-CS notwithstanding the comments below to be consistent with CLMG No.1.

Table 1 Summary of DSI Comments

Report Section	Comment
Section 2.3 Hydrology	A draft PSI dated 19 September 2017 provided at the Project meeting 19 September 2017 was initially reviewed. AECOMs feedback (via email 7 November 2017) noted that the draft PSI was lacking information on local hydrogeology. While the NES-CS is focussed on soil, it is appropriate to consider all potential exposure pathways related to disturbance of contaminated soil such as impacting water supply. There will be site specific hydrogeology information available from the site works completed and information of the farm water supplies should be included for completeness in accordance with Contaminated Land Management Guidelines (CLMG) No.1. This was not addressed in the final PSI submitted with the application or in the DSI.
Section 3.4 Quality assurance /quality control	Chain of custody documentation is referred to but not provided. Inclusion of the chain of custody is a quality assurance and quality control requirement of CLMG No. 1.
Appendix A Figure 3	It was noted in the initial AECOM review of the Draft Contaminated Land Management Plan that Figure A 2 illustrating areas where DSI samples were to be undertaken was very general. AECOM considered that once access to properties was obtained an updated plan showing the specific areas to be investigated would be appropriate. This was has not been addressed and the same base map has been used for Figure 3 in the DSI. The scale of the figure is not appropriate as it could not be used to locate the sample locations onsite. A zoomed in figure for each area sampled should be provided.

3.2 Construction Environmental Management Plan

The following was noted with respect to the December 2017 draft CEMP in AECOMs letter dated 3 May 2018:

- Table 3.1 listing key legislative requirements, regulation and standards, is missing The Health and Safety at Work Act 2015 (HSWA).
- Table 3.2 listing plans, standards and guidelines associated with environmental aspects, lists out of date documents with respect to asbestos. The correct references should be:
 - Health and Safety at Work (Asbestos) Regulations 2016.
 - WorkSafe New Zealand Approved Code of Practice: Management and Removal of Asbestos November 2016 Amended December 2016.

The following was noted with respect to Hazardous Substances in the December 2017 draft CEMP in AECOMs letter dated 9 May 2018:

- In Section 3.2.1 Table 3.1 listing key legislative requirements, regulation and standards, is missing The Health and Safety at Work Act 2015 (HSW) under which hazardous substances in the work place are now regulated.
- In Section 3.2.2 Table 3.2 listing plans, standards and guidelines associated with environmental aspects, references out of date documents with respect to hazardous substances. Hazardous Substances (Tank Wagons and Transportable Containers) Regulations 2004 should be replaced with Health and Safety at Work (Hazardous Substances) Regulations 2017.
- Section 5.3 refers to best practice as required by guidelines set up under the HSNO. This section also need to refer to the HSW and suggest regulations and code of practices are added to guidelines.

The above comments have not been addressed and no changes have been made to the outdated references in the May 2018 CEMP.

3.2.1 Contaminated Land Management Plan

AECOM have reviewed the May 2018 Contaminated Land Management Plan (CLMP) (forming an appendix to the CEMP). Some of the items identified in the review of the December 2017 draft CLMP have not been addressed and are repeated below with additional comments:

- The glossary defines CLMP and states that 'also referred to as a Remediation Action Plan' however, a remediation action plan has a different purpose to a management plan.
- Section 2.2 refers to Health and Safety at Work Act 2016, the correct year is 2015.
- Figure A 2 referred to in Section 3 and 4, illustrating locations of HAIL activities is very general. Updated plans showing the specific areas investigated would be appropriate (at a scale that sample locations could be relocated onsite if necessary).
- Section 4.3. Managing impacted soil on site could be appropriate but would depend on the contaminants and the site setting and would need to be subject to approval.
- Section 4.7.3 should detail the specific criteria to be used. As the intention is to relocate most soil on site, the criteria for determining suitability to remain onsite should be specified. Spoil disposal areas won't be used for commercial / industrial purposes at the end of the project, particularly if any disposal areas are outside the final designation boundary at completion of the Project. Background concentrations of select metals in the Taranaki region are provided in *Landcare Research New Zealand Ltd, July 2002. Maps of total soil concentrations (background levels) of chromium, copper, lead, nickel, vanadium, and zinc in the Taranaki Region.*
- Section 5 outlines what will be included in the works completion report which will be provide at completion of the ground disturbance works. Given the long duration of the project staged reporting would be appropriate.

4.0 Proposed Conditions

The conditions currently proposed by NZTA, in consideration of DSI findings are:

21. The Consent Holder shall have in place until the Completion of Construction Works, a Contaminated Land Management Plan (CLMP) prepared by a suitably qualified and experienced practitioner as required by the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.
22. The CLMP shall be in general accordance with Ministry for the Environment Contaminated Land Management Guideline No. 1: Reporting on Contaminated Sites in New Zealand (Revised 2011). The CLMP shall include procedures to manage the effects of contaminated or potentially contaminated soils on human health and the environment during ground disturbance activities, including the following :
 - a. site establishment procedures;
 - b. classification of soil to be disturbed;
 - c. soil management procedures for off-site disposal; and
 - d. unexpected discovery of contaminated material protocol and requirement to record and track placement of any such material if reused on-site.

AECOM recommend that a specific version of the management plan is referred to in the condition but that the condition allows for updates to the plan. AECOM understand the process of updating and approving all management plans is being agreed between the applicant and NPDC.

5.0 Closing

If you require any further information please do not hesitate to contact the under signed.

Yours faithfully



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Sarah Knowles is an Associate Director in the Geoscience and Remediation Services team at AECOM New Zealand Ltd. She holds a Bachelor of Technology (Environmental Engineering) (1999) from Massey University. Ms Knowles is a Certified Environmental Practitioner (CEnvP) Contaminated Land Specialist who has provided advice and expertise in respect of risk assessment and contaminated land management for over 14 years.

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APPENDIX E: Comments from Wildlands Consultants, dated ~~30~~ July 2018

**REVIEW OF ECOLOGICAL ASPECTS OF
THE APPLICATION TO REROUTE SH3 AT
MT MESSENGER, NORTH TARANAKI - JULY 2018**



 providing
outstanding
ecological
services to
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REVIEW OF ECOLOGICAL ASPECTS OF THE APPLICATION TO REROUTE SH3 AT MT MESSENGER, NORTH TARANAKI - JULY 2018



Valley to east of SH3, Mount Messenger

Contract Report No. 4402f

July 2018

Project Team:

William Shaw - Project lead

Tim Martin - Report author: vegetation, synthesis of disciplines

Kelvin Lloyd – Report author: mitigation and biodiversity offsets, peer review

Nick Goldwater - Report author: aquatic habitats

Jacqui Wairepo - Report author: herpetology

Brian Patrick - Report author: terrestrial invertebrates

Rachel McClellan - Report author: avifauna

Kate Richardson - Report author: avifauna

Kerry Borkin - Report author: bats

Prepared for:

New Plymouth District Council

Private Bag 2025

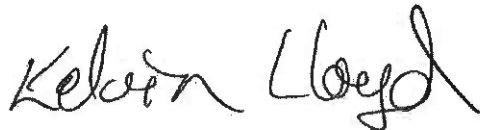
New Plymouth 4342

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Reviewed and approved for release by:



Kelvin Lloyd
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Wildland Consultants Ltd

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1. INTRODUCTION

New Plymouth District Council commissioned Wildland Consultants Ltd to provide an independent audit of the ecological components of a resource consent application to reroute SH3 at Mount Messenger, Taranaki. The New Zealand Transport Agency has selected a preferred route that passes to the east of the existing SH3 at Mount Messenger.

An initial assessment of the Alliance specialist ecology reports was provided to New Plymouth District Council in late October 2017 (Wildland Consultants 2017). This assessment was provided to Alliance ecologists, and gave them the opportunity provided to revised specialist reports prior to lodgement. Resource consents and Notice of Requirement (NoR) were subsequently lodged on 15 December 2017, and the lodged specialist reports were provided to Wildland Consultants for review. Wildlands subsequently provided a review of the Application (the Notice of Requirement Technical Reports) (Wildland Consultants 2017a). This review focussed on issues raised in the initial review of the draft assessments, and the degree to which these were addressed and resolved in the Application.

In May 2018, Wildlands reviewed and reported on the draft Ecology and Landscape Management Plan and the S92 responses provided to New Plymouth District Council. Wildlands took part in a series of teleconferences with the Alliance in April and May 2018 and subsequent to this, agreed on meeting minutes documenting the discussions held.

This report now provides a review of the revised Ecology and Landscape Management Plan dated 17 July 2018, and a subsequent version, which included missing appendices, provided by the Applicant on 26 July 2018. This report also provides further comment on the proposed designation conditions, downloaded from the New Plymouth District Council website on 26 July 2018. This report includes:

- Key changes to the Ecology and Landscape Management Plan following revisions by the Alliance.
- A summary of major outstanding concerns.
- A review of the proposed designation conditions and how these should be modified or added to ensure key outcomes are met.

2. REVIEW OF REVISED ECOLOGY AND LANDSCAPE MANAGEMENT PLAN

2.1 Lack of evidence for poor ecological condition for habitats to east of SH3

Evidence for the poor ecological condition of the area to east of SH3 has not been provided. This has been raised in previous reviews of the Application by Wildlands. This is a significant issue as proposed improvement in the condition of this forest is a major component of the Applicant's mitigation package.

2.2 Assessment of ecological values

Further justification should be provided that the swamp forest has the “greatest ecological significance” in the wider project area. Notably it is of high value, but is of limited extent compared to far more extensive high quality hillslope forest within the proposed project footprint.

Kahikatea-swamp maire forest should be of “very high” ecological value.

As previously discussed, the ecological value of vegetation communities needs to consider fauna values (otherwise it is not an ecological assessment but strictly a botanical assessment). For example a vegetation type that is likely to support At Risk reptile species should not be assessed as being of ‘Low’ ecological value. Similarly, vegetation that may support bat roosts (e.g. treefern scrub) should not be assessed as being of ‘Low’ ecological value.

2.3 Assessment of significant trees

The planting of 200 seedlings for each significant tree to be felled is one of the key components of the Applicant’s mitigation package. However the draft ELMP (May 2018) stated that substitution of significant trees with other species was possible, if plantings of these species failed at the restoration sites (Section 4.6.2.3):

“Any areas with moderately well drained soils (ie. lower soil moisture) will instead be used for mitigation “dryland” planting. Planting of most significant tree species will be focused in these areas. If excessive failure of plant establishment occurs for hydrological reasons such as excessive flooding, species more suited to the conditions will be planted”

In the teleconference, on 1 May 2018, Roger McGibbon acknowledged this was a mistake, and that the ELMP would be amended to reflect that. However substitution is still allowed for in Section 4.6.2.3 of the revised ELMP. This gives no reassurance that this mitigation measure will successfully address the adverse effects on significant trees. The Applicant should also provide performance measures for every component of the mitigation package, including significant tree plantings.

In the teleconferences, clarification was sought by Wildlands for how the Applicant developed and applied the definition for “significant trees”.

“Significant trees were determined as having **one or more** of the following attributes:

- Being large and old (typically emergent) trees.
- Being relatively uncommon.
- Having significant habitat value for other flora and fauna such as, providing important flowering or fruiting resources, cavities for roost and nests, and supporting large epiphyte communities.”

It is still not clear in the revised ELMP which criteria were met by the 17 trees identified by the Applicant. It is possible that trees are only regarded as significant by the Applicant if the first criterion is met “large and old (typically emergent) trees”, or

if all three criteria are met. It would be useful if the Applicant provided a breakdown of the number of trees selected using each of the three criteria.

It remains the opinion of Wildlands that many indigenous tree species that meet the Applicant's definition for "significant trees" are not identified as significant, and therefore not considered for replacement plantings.

It is still not clear why kahikatea and swamp maire have been excluded from the 17 significant tree species within the footprint listed by the Applicant, given their inclusion in the significant tree list provided by the Applicant, and the project footprint including 0.159 hectares of "kahikatea swamp maire forest", 0.525 hectares of "kahikatea forest", and 0.641 hectares of "kahikatea treeland". Similarly, it seems very unlikely that only one miro tree is present within the project footprint when the footprint includes 0.536 hectares of miro rewarewa kamahi forest.

The Applicant needs to review how the significant tree criteria were developed and applied. The current list of significant trees indicates that the criteria have not been fully applied.

2.4 Improvement of forest canopy health

As previously discussed the likelihood that canopy health can be improved, and the magnitude of this change, cannot be assessed (revised ELMP Section 3.5.1). No quantitative data (or even semi-quantitative observations) has been presented as evidence in the revised ELMP for the poor health of the forest canopy. This was requested in the teleconference on 1 May 2018.

2.5 Misleading statements regarding likely ecological gains

Section 3.5.3 of the draft ELMP stated that, with regards to the project, "the result will be the conversion of these *valleys* back to fully-forested and connected swamp and riparian forest and the elimination of forest edge". This is unachievable in the Mangapepeke Valley, where the restoration occurs in the same valley as the proposed road, and where the road will separate habitats and create new edges. If this statement is only in respect to the Mimi Valley, away from the road, the statement needs to be modified to not refer to valleys 'plural'.

2.6 Edge effects

Section 4.2 refers to an allowance of five metres for edge effects. As previously discussed, edge effects of 50-100 metres is more supportable based on long-standing literature for forest environments. Edge effects were discussed in the teleconference on 1 May 2018 and it was agreed that the Alliance would provide a quantification of net forest edge, on the completion of plantings. This has not been provided in the revised ELMP.

2.7 Extent of high value ecological areas adjacent to project footprint

The wording of Section 4.4.1 of the draft and revised ELMP is misleading as it could imply that clearance of high value ecological areas is to be avoided. As per the previous review (Wildlands 2018) the wording should be changed to something along these lines: “clearance does not trespass into high value ecological areas *further than necessary*”, as vegetation clearance definitely would occur within areas of high value indigenous vegetation.

Section 4.4.1 refers to the mapping of high ecological value margin areas in Figures 4.1 and 4.2, and Appendix A - the Ecology Constraints Map. Sheets 6-10 (the southern half of the route) are missing from Appendix A and could not be reviewed.

The mapping of ‘high ecological value margin areas’ in Figures 4.1 and 4.2 only includes three small areas in the Mangapepeke catchment, and three areas in the Mimi catchment. This error was raised in the review of the draft ELMP and remains in the revised ELMP. This mapping conflicts with Table 2.1 of the revised ELMP (e.g. which includes 6.5 hectares of tawa rewarewa kamahi forest, listed as “High”, and the mapping of high ecological value areas provided by the Applicant in the Vegetation Technical Report 7a (e.g. Figure 3.3), which shows that most of the route passes through vegetation that is of high ecological value, e.g. tawa rewarewa kamahi forest, miro rewarewa kamahi forest, pukatea nīkau forest. Additionally, the overall assessment in Table 2.1 of the ELMP for affected vegetation is “High”.

Where the Applicant has mapped “high ecological value margin areas” is critical, as the ELMP states that in these areas the margin of vegetation clearance for the additional works area (AWA) will be restricted to five metres. In areas of lower ecological value, the margin of clearance for the AWA can be 20 metres. A five metre margin for the AWA is justified for all habitats of “high ecological value”, as mapped by the Applicant in Technical Report 7a, and it is unclear why the Applicant has only included a small subset of areas where the extent of indigenous vegetation clearance in high value areas will be minimised.

2.8 Mitigation planting areas

Section 4.6.3.2 of the draft and revised ELMP describes the mitigation planting areas as including area of indigenous vegetation, such as “open remnant mānuka stands”. In the teleconference on 1 May 2018 it was agreed that the Alliance would provide a quantification of the extent of mitigation planting areas within areas of existing indigenous vegetation. This would then allow an assessment of whether there will be a net loss in the extent of indigenous vegetation for the project, once plantings are completed. This has not been provided.

Plantings are only justified where the current vegetation is dominated by exotic species. Where indigenous vegetation is already regenerating naturally, little gain will be made by planting, versus retirement from grazing. The applicant should map the planting units at an appropriate scale to show they are in need of planting, and provide criteria for where plantings are needed, and can be part of a mitigation package, e.g. less than 30% existing indigenous cover. This mapping should, as a starting point, exclude indigenous vegetation mapped in Technical Report 7a. In areas where there is existing indigenous cover, the density of plantings needed is also effectively reduced, which may then require an increase in planting area (e.g. to plant 1 hectare of

indigenous vegetation in an area where 50% of cover is indigenous, two hectares needs to be planted).

In Section 4.6.2.2 of the draft and revised ELMP it is stated that “the biodiversity offset targets for all valley floor plantings are to obtain a near complete cover of indigenous species *across the valley* (including riparian areas) by year 10”. In the Mangapepeke Valley the valley floor will include areas bisected by the proposed road, so this is unachievable.

In Section 4.6.3.2 of the draft and revised ELMP it refers to dryland mitigation plantings (5.467 hectares) having planting conditions that include “mixed native wetland margins” and “open remnant mānuka stands”. All areas of these vegetation types should be excluded from proposed mitigation plantings, as no planting of these habitats is necessary and it will not increase the area of indigenous vegetation at the site. Exclusion of livestock and feral goats, and control of pest plants is all that is needed to facilitate succession of these vegetation types to higher value indigenous vegetation.

Details provided in Section 4.6.3.2 show that the project will result in a net loss of wetland on an area basis. Exotic rushland, most of which is probably wetland, will be replaced at a ratio of 0.5 hectare replacement planting for every hectare removed. What is the current vegetation at sites where mitigation plantings for exotic rushland will occur? The Applicant lists open pasture, pasture-rushland mosaic, mixed indigenous wetland margins, and mānuka stands. Of these, only wet areas of pasture or pasture-rushland mosaic are appropriate planting sites for mitigation of exotic wetlands. Replacing only half of the current wetland extent would result in a net loss of wetlands, which are an ecosystem type that is a national priority for protection due to significant historic loss of wetland extent.

Section 4.6.3.6 of the draft and revised ELMP provides performance measures for dryland mitigation plantings. These performance measures may already have been met for some of the proposed planting areas e.g. “80% indigenous plant cover” may already be the case for remnant mānuka stands. This highlights the issue that little may be gained by planting within areas of existing indigenous vegetation.

2.9 Performance measures

In the draft ELMP, performance measures were not provided for the following actions:

- In Section 4.4.2 it is stated that where suitable areas exist, in-situ dumping of plant material will occur, and that there is >0.6 hectares adjoining the Mangapepeke Valley where this will occur. No map is provided of where these areas are located, or performance measures for the expected results, e.g. regeneration of indigenous plant species restores 80% indigenous cover within five years.
- In Section 4.4.2 it is stated that other suitable areas exist but no clear indication is given where these sites are, or if in-situ dumping will definitely occur at these locations.

- In Section 4.4.2 *Gahnia pauciflora* and *G. setifolia* are to be salvaged, cultivated and returned to suitable locations. No ongoing monitoring of survival or a target for survivorship of these plants is stated.
- Section 4.4.3, regarding logs and debris for stream restoration, mentions that a number of each size of log will be added to the detailed report. Placement of logs in streams for restoration purposes requires performance measures.
- Section 4.4.4 states that weed control on exposed soil mounds will occur every six months. No performance measures are given regarding the degree of weed control to be achieved at the site, for example the weed species that need to be controlled.
- In Section 4.6.2.4 no performance measure is given for the control of weeds for the period between the exclusion of livestock removal and planting. This is likely to be a period when weeds flourish due to the exclusion of stock.
- Section 4.6.2.7 states that a 35 year performance measure will be used for the establishment of kahikatea. Interim assessments, at earlier dates (for example every five years), is recommended in case any additional work is needed to ensure this measure is met at Year 35, e.g. additional plantings, additional pest plant control.
- There are no performance measures for Section 4.6.4.5 actions (exclusion of livestock and feral goats from riparian restoration areas). This needs to be addressed.
- Section 4.8, Table 4.1, states that “Propagules of any threatened or regionally distinctive plant within the project footprint will be harvested and material cultivated from these plants will be returned within restoration planting areas.” This requires performance measures based on establishment success of these threatened and regionally distinctive plant species.
- For Section 7.4.7, the lizard release site, performance measures are needed for the level of pest animal control achieved, and the integrity and effectiveness of all fencing. These performance measures should specify the timeframe for which this area will be managed. Pest control targets should include control of hedgehogs within the release site.
- Sections 11.5.1 and 11.5.2 refer to plague skink and Argentine ant introduction and subsequent eradication. These require appropriate performance measures (e.g. eradication is attempted for all new invasions during the construction phase).

Technical report 7e (Avifauna) does not include performance measures for the kiwi exclusion fences (Sections 4.3.2 and 4.5.1.3). The proposed locations of these barriers need to be identified, and performance indicators relating to avoidance of kiwi mortality caused by the new road.

In contrast to previous sections (e.g. 4.6.4.8), Section 4.6.5 does not include performance measures for addressing significant tree loss. Planting these trees does not in any way compensate for their loss; it is the successful establishment of the trees that can partly address the loss. An appropriate performance measure for plantings to address significant tree loss would be:

- For each significant tree felled, 200 planted saplings of the same species are present within areas of indigenous plantings 10 years following planting.
- At least 90% of these saplings are in good health, have grown in height at least 50 centimetres, and are either two metres tall or are emergent above the height of surrounding competing vegetation.

Section 4.7 specifies that the maintenance period will be up to six years. The maintenance programme needs to be continued until the agreed performance measures have all been met. If this is longer than six years, then additional maintenance years will also be required.

2.10 Effects of road construction on bats

The ELMP states in Section 3.2 Avoidance and minimisation of effects: “Before and after the selection of the preferred route, significant alterations to the road design have occurred to minimise the likely effects. These include:

Inclusion of an approximately 240m long tunnel through the ridge dividing the Mangapepeke and Mimi catchments. The tunnel has greatly reduced the size of the cut and fill area that would otherwise have been required and has preserved the important east - west connectivity of habitat (ridge to coast) and mobile animal movement (especially bats)”.

It was discussed during the teleconference, held on 11 April 2018 between Council nominated ecologists and Alliance representatives, that because flight paths were not determined by radio tracking, the Alliance could not prove that constructing the tunnel would maintain an important corridor for bats. The Alliance agreed to amend this wording. This has not occurred.

Section 2.2 - Summary of ecological values Table 2.2: Summary of Ecological Values

Long-tailed bats are now recognised as Nationally Critical. This has now been addressed in the revised ELMP but was not shown as a tracked change in the version provided by the Alliance.

The revised ELMP states on Page 19 (Section 3.5.1 Pest management in perpetuity):

“As forest and vegetation health improves in the low-pest environment, the carrying capacity within the Pest Management Area (PMA) for many indigenous animal species will increase substantially. This will result in spill over benefits for surrounding areas as juvenile birds and bats disperse. Because the pest management is proposed in perpetuity (or until such time as pest management in the form we know of it today is no longer necessary to sustain the levels of biodiversity created) the ecological and landscape benefits throughout the region should be permanent.”

As noted in Wildlands’ review of the draft ELMP: “It is unknown whether the “halo effect”, i.e. dispersal of juveniles to an area wider than their natal area (the area that they were born in) may occur for bats. This is because research into long-tailed bats shows that bats return to their natal social group to breed (O’Donnell 2000b). Social groups occupy traditional areas long-term, and individual bats rarely switch or leave

their social groups rarely, although rates may increase as density increases (O'Donnell 2000b). During winter it appears that long-tailed bats remain in their summer areas and do not disperse to other areas (Griffiths 1996).” This assessment still stands.

Section 4.8 - Supervision protocols for vegetation and habitat clearance and potential impacts to associated species Table 4.1 - Ecological Management Protocols

The table section on bat management suggests that there will be no further attempts at capture and radio-tracking of bats, which was initially intended to “locate and describe bat roosts within the Project footprint, and identify important foraging areas prior to construction”, as this has been deleted from the table. This may mean that important bat habitat is not identified.

Changes to this table also indicate that vegetation removal protocols have been modified since the last review of the ELMP.

The following part of this review refers to the Section 5 Bat Management Plan

Section 5.6 - Page 56 Summary of potential effects on bats

The teleconference minutes state the following in relation to this section:

“BMP only includes tree removal protocol and doesn't directly address roost loss, although in the Introduction section to the ELMP it says it will. Other issues raised but apparently not directly addressed include construction noise, vibration, vehicle strike, fragmentation. MMA acknowledge that these things need to be addressed in the BMP. MMA action agreed.”

Actions to address these issues have not been addressed in the revised ELMP.

The teleconference minutes state the following in relation to this section of the BMP:

“DOoC have stated that they will set aside the MMA's version of the Bat Management Plan (BMP) and replace it with the NZTA/DoC bat framework template including tree removal protocols. 15 cm DBH limit on trees is not negotiable. DOC will specify numbers that currently have xxxx in the template e.g. antecedent precipitation, tree DBH”.

It appears that this either is not the case or has not taken place. Instead, throughout the Bat Management Plan section (BMP) the NZ Transport Agency bat framework (Smith *et al.* 2017) has not been adhered to, and the 15 cm DBH (Diameter at Breast Height) limit on trees has been deleted. Instead, an alternative vegetation removal protocol (VRP) has emerged that proposes a combination of only implementing VRP requirements for trees greater than 80 cm DBH, and only for trees with DBH between 50 and 80 cm DBH that have a restricted range of features that make them likely to be bat roosts. This greatly reduces the protection for bats that may use vegetation with DBH < 50 cm, as with this version of the VRP there will be no protection of bats roosting in any trees with DBH < 50 cm. This could result in significant adverse effects on bats.

The updated BMP states the following as a summary of which vegetation VRPs will be applied to:

“All parts of the vegetation removal protocol (VRP) below apply to all trees > 80cm diameter at breast height (dbh) and trees between 50cm dbh and 80cm dbh which are classified as having features suitable for bat roosting as identified by the Supervising Bat Ecologist (SBE). In this instance suitable bat roosting features include five or more nested epiphytes located on horizontal branches or sufficient damage to the tree crown or truck (sic) that provide roosting voids”.

The way this is written could be interpreted as only the noted features i.e. *“five or more nested epiphytes located on horizontal branches or sufficient damage to the tree crown or truck (sic) that provide roosting voids.”* being suitable roosting features. This does not encompass the range of bat roosting features that smaller trees may have.

There is no evidence provided to support the change to exclude all vegetation that has a DBH < 50 cm DBH from being checked for the presence of bat roosts. Indeed, the references to research that has taken place in the North Island that discussed the DBH of trees with bat roosts have been deleted from the revised version ELMP (Section 5.7.5 DH.4 Roost Identification DH.4.1 Potential roost identification - habitat assessment). This section previously outlined the following: *“[Note: Roosts tend to be observed in mature trees that are >15cm dbh (Borkin 2010); however, native bats have also been observed in tree ferns and cabbage trees (Borkin 2010; Sedgeley and O'Donnell 1999; 2004). Therefore habitat assessment should be broad, encompassing mature trees and other vegetation types and should consider the following criteria.”* Excluding all vegetation < 50 cm DBH from these checks will expose long-tailed bats to risk of injury or death due to tree felling.

Section 5.7.2 - DH.1 Definitions

This section states: *“Visual surveys include a visual inspection of potential roost sites to confirm the presence of bats and/or bat signs, i.e. guano”.* There are additional signs of bat presence including staining and being able to hear social calls. These should be included in the list of signs that suggest the presence of bats.

Section 5.7.3 - DH.2 Introduction, 5.7.4 DH.3 Quality Assurance

It is unclear why *“The relevant provisions of DOC’s Best practice manual of conservation techniques for bats (Sedgeley et al 2012)”* are no longer referred to as *“should be adhered to”* as in the previous version of the BMP and now are to be *“followed in general accordance for all aspects of bat work”*. This is concerning.

This section goes onto state: *“The vegetation removal protocol (VRP) will apply to all trees > 80cm dbh and trees between 50cm dbh and 80cm dbh which are classified as having features suitable for bat roosting as identified by the SBE”.* As it is written, the VRP currently excludes non-tree vegetation e.g. cabbage trees, tree ferns, epiphytes, and features considered suitable for bat roosts have not been defined adequately.

Section 5.7.5 - DH.4 Roost Identification DH.4.1 Potential roost identification - habitat assessment

This section now states: “*All potential roost trees in the site must be clearly marked.*” In the original (draft) ELMP it stated that “*All locations where vegetation may be disturbed must be surveyed by the SBE for ‘potential bat roost trees’*”. There are no methods for survey/searching for potential roosts mentioned in this current version of the ELMP and it is unclear whether this will take place.

Section 5.7.8 - DH.4.2.2 Visual

This section now states: “*Each tree or vegetation with features that make it a potential roost may be inspected to confirm the site as a roost. This may be subsequent or prior to ABM monitoring depending on the method of roost confirmation chosen and is at the discretion of the SBE*”. The following sentence, or similar, should be included as clarification: inspections of potential roosts should take place on the day that felling is to occur. This is because bats may change their roosts regularly and the fact that bats are not present on Day 1 does not mean that they will not be present on Day 2 or other subsequent days. Roost emergence watches should only take the place of visual inspections if these are unable to occur due to health and safety reasons as bats can be easily missed when emerging from their roosts.

This section also acknowledges that vegetation much smaller than 50 cm diameter can support bat roosts, as it states: “*potential roost locations are within tree ferns or other ‘delicate vegetation’*”. Tree ferns only grow to a maximum of c. 30 cm diameter.

5.7.9 DH.5 Vegetation Removal

This section now states: “*Trees identified as <50cm dbh and 50cm to 80cm dbh without bat roosting features by the SBE can be removed at any time of the year. The SBE should be available for the duration of all vegetation clearance operations in all areas where vegetation is >80cm dbh and between 50cm and 80 cm dbh where trees are deemed to have bat roosting features. The SBE shall advise staff should bats be detected (leaving trees or injured) and to inspect each felled tree or vegetation for signs of bat roosts.*” Removing or felling vegetation with DBH less than 50 cm at any time of year will expose long-tailed bats to risk of injury or death during vegetation removal operations. The current version of the BMP suggests that any vegetation with DBH of less than 50 cm will not be surveyed or checked for bats in any way. This also puts long-tailed bats at unnecessary risk of injury or death due to vegetation removal/felling.

This section goes on to state (crossed out words show changes between versions of the BMP): “*If no bat activity is recorded and a roost has not been found visually (Section 5.7.8) or by observation (Section 5.7.7) then the tree or vegetation can be cleared. ~~Removal must occur on the same day as the visual inspection.~~*” There is no longer a requirement for removal of vegetation to occur on the same day as the visual inspection or the day immediately after roost emergence watches or entries have taken place. Bats may change their roosts regularly and the fact that bats are not present on Day 1 does not mean that they will not be present on Day 2 or other subsequent days. This requirement should be reinstated.

This section goes on to state: *“If bats are confirmed to still be roosting by following DH4 after seven days then an agreed team of including the SBE and contractor representatives will be contacted to re-assess and consider alternative methods to progress vegetation removal. This will be a risk assessment-based approach dependent on the type of roost identified. The team shall include a council ecologist or their nominated representative, a DOC nominee, a contractor nominee and the SBE. If the team cannot make a decision within 48 hours of the meeting taking place then the [xx] council shall be advised and a final decision made by the certifying officer/DOC.”* The current wording suggests that there is no longer the requirement to discuss methods to progress vegetation removal with a wider panel of experts than are directly employed on the project. The lack of transparency into the decision making process that may occur when a critically threatened species is at risk is concerning, and pressure may be put on the project’s bat ecologist (SBE) to progress vegetation removal in a manner that is not in the bats’ best interest. It is strongly suggested that the requirement for a wider team of experts including DOC nominee, and council ecologist or their nominated representative is reinstated.

During the teleconference there was discussion about how bats should be released back into the area if they were discovered during vegetation removal/tree felling and needed to be taken to a vet for assessment. During this discussion, based on the then current version of the BMP, it was queried why temporary roost boxes were being used and whether these could be made permanent for no additional expense to MMA. All discussion of the use of roost boxes has been removed from the current version of the BMP and consequently mitigation efforts are reduced compared to the previous version of the BMP and wider ELMP. These changes have not been shown as tracked changes in the ELMP version provided by MMA.

General comments about the BMP section

The previous version of the BMP only included a vegetation removal protocol and some discussion of night works and lighting. The BMP didn’t directly address roost loss, although in the Introduction section to the ELMP it indicated that the BMP would. Other issues raised in the ELMP but apparently not directly addressed within the BMP included construction noise, vibration, vehicle strike, and fragmentation. The Alliance acknowledged during the teleconference that these matters needed to be addressed in the BMP but this has not occurred.

During the teleconference it was also discussed whether the effect of the road corridor on habitat use by bats and the risk of vehicle strike had been appropriately addressed in the BMP. There have been no changes made to the ELMP to address this directly. During the teleconference the Alliance also agreed to ensure that the lighting design process has steps to recognise effects on bats. Specific steps that detail how this will occur have not been included in the BMP.

Section 12.2 - Training 12.2.2 Training Table 12.2 - Ecological Training

It was agreed during the teleconference (11 April 2018) that every arborist would be trained to recognize bat sign. The revised ELMP has not been amended to reflect this agreement. Training of all arborists to recognize bat sign, a defined method by which

the presence of sign would be communicated to the on-site ecologist and the SBE in a timely manner, and the halting of felling/vegetation removal if/when bat sign is observed, would provide an additional layer of protection to bats.

Alignment with other sections of the ELMP:

During the teleconference it was agreed that other parts of ELMP also needed to reflect bats, for example, destructive searching of epiphytes and fern skirts could affect bat habitat. It was agreed that all reports must be reviewed to identify other potential conflicts (e.g. control of willows may impact bat roosts). The Alliance agreed that this would take place. The potential overlap with destructive searching for lizards and bat roosts has been noted in the Herpetofauna section of the ELMP. It is unclear whether other potential conflicts have been considered, for example, the control/removal of willows, which may be potential bat roosts.

Section 3.5.4 of the ELMP - Effects not directly accounted for by the Biodiversity Offsets Accounting Model states:

“The achievement of no net loss and then net gain will be measurable for vegetation, stream habitat, and many bird species. However, research suggests that measurement of no net loss for long tailed bats, lizards, and invertebrates may not be possible (refer to the monitoring section in Chapter 9 of this ELMP). This is not necessarily because the proposed measures will not result in a beneficial effect, but because the monitoring methods available are not necessarily able to detect it.”

As discussed during the teleconference, methods are available to measure and potentially detect changes, if any, in bat activity, behaviour, and population. However no such methods have been included in the ELMP.

2.11 Avifauna Management Plan

The draft ELMP (March 2018) did not include whitehead and long-tailed cuckoo in the list of “Key Threatened and At Risk species of interest for which breeding habitat occurs within the Project Footprint”. This has been addressed as these species have been added to the list in the revised ELMP.

Kōkako were also not included on the list, and this has not changed for the revised ELMP. We recognise that the species has not yet been recorded within or adjacent to the Project footprint. However, kōkako is classified as At Risk-Declining, is extremely rare in the region, is the focus of an intensive iwi-led recovery programme at Parininihi, and potential breeding habitat occurs within the Project footprint. Importantly, the Project footprint is well within recorded dispersal distances of translocated birds. Some birds translocated to Parininihi have not yet been re-sighted, and may have dispersed beyond the management area, and a further release has been carried out in April 2018. More may be undertaken in the years ahead. For the reasons above, kōkako should be a key species of interest addressed in the ELMP.

The draft ELMP limited discussion of management of avifauna effects to kiwi management and did not address kōkako. The updated Avifauna Management Plan now states the following:

"If a kōkako is encountered in or near the Project footprint during road construction, DOC will be notified but no further action will be taken because:

- 1) if kōkako want to settle in the Project area it should be left to do so, given that it may eventually benefit from pest control in the wider PMA; and*
- 2) if it is a transient, it will move away naturally, potentially back to its release site in Parininihi."*

It is not clear whether 'Project footprint' and 'Project area' (as written above) are the same thing; they are not defined in the ELMP. A transient individual using a forest area to be cleared will presumably move away from the area of disturbance, and the effect on the individual will likely be minor. However, the effect will be considerably greater if a pair have a nest, or have established a territory, within an area to be cleared. The Avifauna Management Plan states the following in relation to brown kiwi:

"The main objective of the during-construction kiwi management protocols is to prevent kiwi and their eggs and chicks from being harmed or killed by machinery during vegetation clearance and substrate disturbance."

The plan contains extensive explanation on how this is to be achieved. The same attention has not been given to kōkako. The location of a kōkako territory or nest away from Parininihi is of comparable conservation import to the protection of breeding brown kiwi. This possibility needs to be addressed within the Avifauna Management Plan.

The S92 response indicated that monitoring of kōkako would be undertaken at the same time as kiwi monitoring during construction. This has not been mentioned in the Avifauna Management Plan. The plan needs to address how kōkako will be surveyed prior to and during construction, taking into account that recently-released kōkako may not be particularly responsive to playback or very vocal, so the reliability of any survey results will depend on the timing in relation to the release of new birds.

We also note that Table 2.2 'Summary of Ecological Values' (p10) states the following in regard to kōkako:

"North Island kōkako (Callaeas wilsoni; Threat Status: 'At Risk - Recovering') were released into the western part of the Parininihi area in winter 2017. The release site was approximately 4km to the west of Mt Messenger, and approximately 4.5km from the nearest parts of the Project footprint. Young kōkako typically do not disperse far from natal areas and the natural rate of spread of a population from a source location is slow. This indicates that kōkako of Parininihi origin are unlikely to colonise the Project area for years, and possibly decades."

The difference between juvenile dispersal and post-translocation dispersal was discussed at the teleconference (Rachel McClellan, John McLennan and Brett Ogilvie). The statement above does not take into account the potential outcomes of post-translocation dispersal. While some birds remain within a few kilometres of the release location, and establish territories relatively quickly, other individuals have been shown to disperse well over 5 km or more from the release location, and to take months to establish a territory. The most recent release of kōkako into Parininihi was in April 2018 and the population may require further supplementation to ensure

genetic variability. This should be taken into account given the project is projected to take four years to complete. It is clear that the Project footprint is within post-translocation dispersal distances of kokako.

2.12 Herpetofauna management plan

Section 7.1 - Introduction

In the review of the draft ELMP (Wildlands 2018) it was suggested that the plan be renamed a 'Herpetofauna management plan' to account for the uncertainty of indigenous frogs being present. This has been addressed.

The Wildlands review of the draft ELMP queried how restoration planting be considered as of benefit to lizards given the volume of habitat removal. It asked "*how can restoration plantings re-create the structural diversity and complexity of micro-habitats which have been formed over many decades and even centuries?*"

The Alliance responded by referring to Chapter 3 where it is stated: "*It is expected that these areas of mitigation planting will resemble what is removed in a matter of a few years*". This is a gross overstatement of the level of structural complexity reached by plantings in their early years of establishment.

Section 7.3 - Potential adverse effects on lizards

Wildlands (2018) noted for the draft ELMP that Section 7.3 should be amended to state: "Lizard injury or death, including during vegetation clearance and construction activities". This has not been addressed in the revised ELMP.

Section 7.4.3 - Protocol A: Identification of lizard habitats

In the review of the draft ELMP, Wildlands (2018) noted the high habitat values of vegetation such as mānuka and kānuka which have been assigned low ecological value in other areas of the application. This has been addressed with a clearer definition of what constitutes high value lizard habitat to be prioritised. This does include "*individual trees with high epiphyte loading (five or more perched nested epiphytes located on horizontal branches), areas of native scrub, wood piles and existing sheds and other structures proposed for demolition.*" It also notes that the project lizard ecologist will determine the location of high value habitat.

The revised ELMP better addresses our concerns regarding the discrepancies between what has been classified low/moderate value vegetation versus corresponding fauna habitat values.

Section 7.4.4.1 - Nocturnal searches

This section previously described the use of Artificial Cover Objects (ACOs), and following conversations during the teleconference it was explained that these were being questioned. The use of these has been removed from the methodology.

Section 7.4.4.3 (now removed and summarised within 7.4.4.1)

In the draft ELMP a 'two-night survey' or, '20 person-hours of nocturnal searching per hectare' were both stated as being the preferred search protocol. Both of these options have now been replaced with only 10 person hours per hectare, to a maximum of 50 person-hours for high risk habitat (downgraded from previously specified 100 hours). No explanation has been provided for halving the effort spent on locating geckos during nocturnal searches.

Section 7.4.4.2 - Manual, destructive and machine-assisted salvage

In the review of the draft ELMP, Wildlands requested further commentary on trees being stockpiled, and their potential to become skink habitat. This has now been addressed by the applicant's statement that "*stockpiles will be searched for lizards at the time of mulching/removal in case any lizards have not dispersed or have colonised the piles*".

Table 7.1 - has now been removed.

In the review of the draft ELMP, Wildlands requested more detail regarding predicting risk classes for habitat types. Rather than additional detail in the revised ELMP, the table has been completely removed from the plan.

Section 7.4.7 - Protocol D: Relocation/mitigation site

The applicant is developing a specific protocol to suitably address Wildlands comments regarding justification for their previously specified 'soft-release' pen size of 400m² (i.e. 20x20 m). A report¹ has been referred to that refers to a 1 hectare relocation site which is 2.5 times larger than the previous suggestion. Wildlands have requested to see the report in order to evaluate what is now being proposed. This increase in size may better address the uncertainty around capture numbers (i.e. the potential for there to be in excess of 100 lizards).

It is stated that all lizards (except copper skink) will be released into the soft release site. Copper skink may have been excluded due to its status as 'Not Threatened'; however, if this is the case it is unclear if this will also be the case if common gecko and northern grass skink are detected given they are of the same threat status. The applicant correctly states that all lizards are protected under the Wildlife Act and therefore it would be inappropriate to select a single species for exclusion based on its threat status, given it is not the only species likely to be within the footprint that is "Not Threatened". Copper skink should be included within salvage efforts if they are detected, or a strong justification for excluding this species should be provided.

In the revised ELMP, measurements for the predator exclusion fence have been altered slightly (i.e. increase in fence height from 1300mm to 2000mm). Previous suggestions that the lizard sanctuary would be enhanced to provided additional woody

¹ Predator-Proof Fenced Lizard Sanctuary Options, Mount Messenger Bypass Project. Prepared for the Mt Messenger Alliance by Simon Chapman, dated 14 June 2018.

debris from salvaged vegetation and rock outcrops have been removed. These types of enhancements would be beneficial and we suggest they be reinstated within the plan.

For the revised ELMP, the stance that no post-relocation monitoring is required remains unchanged, with justification cited as the difficulty in obtaining pre and post comparative data. As discussed during the teleconference, there are a number of other beneficial outcomes that can be gained by undertaking post-relocation monitoring; the creation of a lizard sanctuary provides an excellent opportunity to monitor how lizard populations within the sanctuary respond to the removal of predator pressures over time. This is particularly noteworthy as whilst it is well understood that mice will predate lizards, there is little data available to demonstrate how lizard populations will respond to their removal. Therefore, to further justify the construction of a predator proof fence and be able to properly evaluate its success or otherwise, we strongly suggest that a five-year monitoring plan be implemented following lizard relocation into the sanctuary.

In the draft ELMP, Table 11.2 outlined a protocol for the discovery of plague skinks. This has been removed from the updated version due to a lack of existing management protocols. Wildlands recommends that if plague skinks are discovered, DOC will be contacted and asked for guidance.

2.13 Freshwater Ecology Management Plan

Section 4.6.4.1 - Potential stream restoration planting locations

This section of the revised ELMP outlines potential stream restoration locations. It appears that there has not been any progress made with confirming the availability of these locations since the freshwater ecology teleconference (6 April 2018). It would be useful if the Alliance could provide a map(s) of the proposed stream restoration locations. During the teleconference it was stated that maps would be provided in a revised ELMP before the hearing. Confirmation is also required as to whether there is a contingency plan if landowners are not willing to participate.

Section 4.6.4.8 - Riparian restoration offset planting performance measures

Alliance has revised the performance targets for the riparian restoration so that 80% indigenous plant cover will be achieved within six years of planting (originally proposed for ten years). This is acceptable, given the standard timeframe for expected canopy cover is around 3-5 years.

Section 8.3.4 - Fish passage and timing of works

We are satisfied with the details provided on fish passage and the timing of works with regards to fish migration and spawning.

2.14 Management of invertebrates

Aquatic macroinvertebrate monitoring

The revised ELMP is highly detailed as to sampling methodology and is well-referenced.

Peripatus

No comments to respond to in this section.

Other invertebrates

Wildlands (2018) previously noted the possible presence of Threatened invertebrates in the project area as follows:

“The statement that the invertebrate fauna is “typical of communities inhabiting primary forests” is poorly supported, especially considering that no targeted surveys of Lepidoptera, including forest ringlet butterfly (conservation status ‘At Risk’) were undertaken.”

This does not appear to have been addressed in the revised ELMP.

2.15 Pest management plan

The area of proposed pest management has been extended from 1,085 hectares (draft ELMP) to 3,650 hectares in the revised ELMP. This change is primarily to increase the likelihood that the pest control results in an increasing population of long-tailed bat. This is a substantial increase in area, and if effectively managed in perpetuity, will result in greater, long-term gains for both vegetation and fauna than the area originally proposed.

It remains uncertain whether the area where pest control is proposed to take place is similar to the project area in terms of species presence, prevalence, and distribution. The proposed pest management does not include the control of introduced wasps, except for the road margins during the construction period. Introduced wasps can have significant adverse effects on indigenous biodiversity, and populations may increase due to the effects of construction, e.g. edge effects creating more favourable habitats for these pests.

As previously discussed, the likelihood of “rapid recovery” of possum-palatable tree species cannot be assessed without quantitative evidence for their current state of health. Similarly, no evidence is provided to support the claim that, in the Paraninihi block, diversity and volume of forest regeneration is far greater than the unmanaged forest to the east of the existing road.

In Section 9.2 “Pest management programme overview - expected results and outcomes” it is stated:

“The intention is to intensively manage target pest species to low densities in perpetuity (or until such time as pest management is no longer necessary) over a 3650ha largely forested area (the Pest Management Area - PMA) (Figure 9.1)”.

Pest management will always be required due to reinvasion from surrounding areas. Section 9.2 again refers to spill over effects for bats. As discussed previously in this review, and former reviews, there is little if any evidence that this is relevant to bats.

In Section 9.5.2 “Pest management targets” it is states that:

“Achieving and holding rat densities to the target 5% residual rat tracking index (RTI) threshold will be the most challenging target and it is likely, based on the experiences of other large-scale NZ rat control programmes undertaken in challenging terrain, that rat densities will not be lowered to 5% in some seasons due to weather or indeterminate reasons. Achievement of 10% rat RTI or lower is generally accepted as a successful outcome. While 5% RTI will remain the target for rats in the PMA, tracking indices above 10% in two consecutive years will trigger the need to review the method used”.

Recent control operations have demonstrated that aerial application of 1080 should knock rats down to 5% RTI or less. The application of 1080 in the Hunua Ranges is an excellent example of what can be achieved (see below).

“The targets for the operation were a reduction in possum and rat densities to below 5 per cent tracking or trapping index and this has been successfully achieved. Of particular note was the reduction in rat densities across the operational area from 91.6 per cent pre-application to 1.03 per cent post the operation. Significantly, no rats were detected at all in the monitoring carried out in the Kōkako Management Area following the operation or in three subsequent monitors carried out at six weekly intervals”.

In Section 9.7 of the revised ELMP the Applicant needs to describe the financial mechanisms that will be put in place to ensure ongoing availability of funds for pest control in perpetuity.

Section 9.5.3.2, which describes outcome monitoring within the PMA, states that the “purpose of outcome monitoring for bird species is to provide sufficient evidence that the stated benefits of the pest control programme on those species affected by the project will be achieved”. The “will be” should be changed to “are”.

2.15.1 Outcome monitoring for avifauna post-pest control

The draft plan stated that monitoring will focus on tui, bellbird, kererū, and kiwi. There was no reference to fernbird and robin, which are also listed as key species of interest. This has been addressed in the revised ELMP.

The draft plan was inconsistent in its timeframes for forest bird monitoring versus kiwi monitoring. The former was to be undertaken for up to 12 years, but kiwi monitoring was to be undertaken for 12 years. This remains the case in the latest draft, so we assume that the discrepancy is not in error. This suggests, for example, that forest bird monitoring could stop after the first three-yearly survey if outcome targets of 20% increases are met. A 20% level of increase (and considerably more) can occur between years for forest bird species in the absence of pest control. Monitoring should continue for 12 years to demonstrate that any increases are maintained.

No control site has been proposed for forest bird or kiwi monitoring. As such, it will not be possible to determine with confidence whether any increases detected are due to the pest management programme, or to other influences such as environmental factors.

North Island fernbird is listed as a species to be monitored, but no detail on how the species will be monitored is provided in the plan. It is understood from discussions that it will be through territory mapping.

The draft plan and revised ELMP state under ‘Adaptive pest management response to monitoring targets’:

“In the event that...more than one of the biodiversity outcome monitoring targets are not met, for reasons associated with the impact of pests or the effects of the road, the pest management programme will be reappraised...”

It is not clear from this statement whether each of the eight bird species represent a single biodiversity outcome target, or eight separate targets. If the latter, this indicates that it will be acceptable for a single outcome target to not be met; for example, for no improvement in kiwi counts to be observed. This possibility does not match with the final sentence of the paragraph which indicates that management methods will be adapted until all biodiversity indicator targets have been met. The latter approach is appropriate.

It is recognised that some best practice pest control methods undertaken by the Department of Conservation sometimes do not produce the outcomes expected for key faunal elements (for example, intensive stoat control for the rarest kiwi species, rowi, failed to significantly reduce the impact of stoats on productivity), and unforeseen events can potentially affect results (such as severe weather or disease). Because of this, the approach to managing outcomes needs to not only be adaptive but also needs to be flexible if it is shown that achieving a particular outcome is not possible. Decisions regarding the adequacy of the adaptive management approach, and any alterations to proposed management tools, approaches or outcomes, should be made by independent experts, based on annual reports on pest control operations and outcome monitoring results.

However, improvement in kiwi abundance has been identified as “The key focal area for avifauna management” (Section 6.3). As such, it is not acceptable for kiwi to be one of the biodiversity outcome targets that is not met. It is possible that kiwi management may require a considerably larger area for pest control, and/or different strategies such as the introduction of young birds (if the existing population is largely old with lower reproductive abilities), or Operation Nest Egg, to achieve the stated 20% increase.

It is noted that during conversations with the Alliance herpetologist that pest control efforts are to also extend to a ‘pest animal exclusion pen’ as part of a compensation and mitigation package addressing effects on indigenous lizards. The compensation component specifically is to address the significant proportion of habitats to be removed that will not be safe or accessible for herpetologists to undertake salvage work in. More detail is needed on the methodology (including site selection and size quantification based on a ‘like for like’ ratio) to be used within this area, with specific focus on mice, hedgehogs, and rats. The description should include management tools including habitat enhancement, and measures against which success can be assessed, i.e. pre- and post-translocation monitoring.

It is also noted that significant uncertainty remains around the benefits of large-scale, mainland pest control to declining herpetofauna populations. Given this uncertainty, the use of pest control outside of the exclusion pen (where herpetofauna population improvements cannot be measured), should not serve as the significant measure of success with respect to mitigating the impacts of the project upon herpetofauna in the wider area. In this sense, it would be preferable to have multiple pest animal exclusion pens installed in a variety of habitats throughout the wider area so that the compensatory nature of these areas can be quantified (or a much larger fenced pest-free enclosure with a variety of habitats).

2.15.2 Pest control outcomes for bats

During the teleconference, and in each review, it has been asked whether there are bats present throughout the proposed pest control area. This question has not yet been answered. The answer to this question will greatly affect the value of pest control to bats.

Section 9.2 “Pest management programme overview - expected results and outcomes” states:

“With habitat improvements in a low-pest environment, the carrying capacity within the PMA for many indigenous animal species will increase substantially. This will result in spill over benefits for surrounding areas as juvenile birds and bats disperse.”

As mentioned in previous reviews by Wildlands, and above, “It is unknown whether the “halo effect”, i.e. dispersal of juveniles to an area wider than their natal area (the area that they were born in) may occur for bats. This is because research into long-tailed bats shows that bats return to their natal social group to breed (O’Donnell 2000b). Social groups occupy traditional areas long-term, and individual bats rarely switch or leave their social groups rarely, although rates may increase as density increases (O’Donnell 2000b). During winter it appears that long-tailed bats remain in their summer areas and do not disperse to other areas (Griffiths 1996).” This assessment still stands.

There are no outcome monitoring targets set for bats and no monitoring of bat activity, behaviour, and/or population proposed, despite the main intent of the size of this control operation being stated as:

“The extension of the PMA to 3650ha has been proposed in part to improve the likelihood (sic) increase in the population levels of the long-tailed bat.”

This means that an “adaptive pest management response to monitoring targets” (Section 9.5.3.3 Adaptive pest management response to monitoring targets) will not take place in respect to bats. That is the following will not occur for bats despite the intent of pest/predator control being to increase the local bat population (Section 9.5.3.3 Adaptive pest management response to monitoring targets Page 121) :

“In the event that pest density targets are not achieved and/or more than one of the biodiversity outcome monitoring targets are not met, for reasons associated with

the impact of pests or the effects of the road, the pest management programme will be reappraised and the intensity or methods used changed to be more effective at addressing the pests or aspects of biodiversity that have not reached the outcome targets. The pest management methods and intensity will continue to be adapted until all pest density targets and biodiversity indicator targets have been met.”

In the absence of monitoring of bats it will remain unknown whether the pest control benefits bats or whether effects of construction and operation of the road are adequately mitigated.

If lesser short-tailed bats are discovered or otherwise detected in the vicinity of the pest control area, or long-tailed bats are found to be likely to consume toxins either directly or indirectly, then pest control operations should be reviewed as soon as possible to take the risks posed to bats into account.

Section 9.5.2 Pest management targets

It is acknowledged that the size of the pest control area has been increased substantially. This area is now of sufficient size that it may provide benefits to bats, i.e. result in an increase in population, *provided other effects are mitigated adequately*. However, it is unclear whether targets set will be adequate to protect bats. This is because a 10% RTI (Rat Tracking Index) has been set as a threshold for success (Section 9.5.2 Pest management targets Page 118).

“Achieving and holding rat densities to the target 5% residual rat tracking index (RTI) threshold will be the most challenging target and it is likely, based on the experiences of other large-scale NZ rat control programmes undertaken in challenging terrain, that rat densities will not be lowered to 5% in some seasons due to weather or indeterminate reasons. Achievement of 10% rat RTI or lower is generally accepted as a successful outcome. While 5% RTI will remain the target for rats in the PMA, tracking indices above 10% in two consecutive years will trigger the need to review the method used.”

Given the predator control that benefited bats in the Eglinton Valley reduced rat numbers to an equivalent of 5% RTI before toxin was removed from the area (O’Donnell et al. 2017), it is unclear whether less intensive rat control will benefit bats to the same degree.

Section 9.5.3 Performance and compliance monitoring 9.5.3.1 Pest density performance monitoring

This section states: *“Annual monitoring in the first 5 years will include 3 sample points - the first immediately prior to the commencement of the bird/bat breeding season and two more through the summer period.”*

It is not clear what “immediately prior to the commencement of the bat breeding season” means. Bats are likely to mate in autumn, delay pregnancy until Spring (Dekrout 1999), be heavily pregnant around November, and then have young that are non-volant (unable to fly) from early December (depending on birth dates) for approximately five-six weeks (O’Donnell 2005). It is assumed that the intent would

be to measure RTI so that resulting predator control protects maternity roosts and non-volant young. This needs clarification.

2.16 Overview of key issues for the revised ELMP

2.16.1 Ecology Constraints Map not provided

The Ecology Constraints Map (Appendix A) is referred to throughout the ELMP and is critical for understanding where different components of the ELMP will be implemented. Sheets 6-10 for Appendix A were not included in the document that was provided to Wildlands.

2.16.2 Mitigation plantings in areas of existing indigenous vegetation

Some areas of mitigation plantings are proposed for areas of existing indigenous vegetation, but these areas are not mapped separately, and cannot therefore be quantified or located based on the information provided. No meaningful gains will be made by plantings in these areas, when the road by default will exclude livestock from these areas, and pest control in the wider area will facilitate regeneration. Given that the ratio for mitigation plantings is a low 1:1, and some of these areas already constitute indigenous vegetation, there will be a net loss of indigenous vegetation and habitats due to the project, and the loss of early successional vegetation is not adequately addressed. To count as mitigation, any plantings must create additional habitat and the Applicant should clearly map where these gains will be made. This was requested in the review of the draft ELMP but has not been provided for the revised ELMP.

2.16.3 Potential for substitution of species

The planting of 200 seedlings for each significant tree to be felled is one of the key components of the Applicant's mitigation package. However in the draft and revised ELMP it is noted that the species of these may be substituted for other species, if the planting sites are not suitable. This gives little reassurance that this mitigation measure will occur, or will be successful. The Applicant should provide performance measures for every component of the mitigation package, including significant tree plantings.

2.16.4 Exclusion of canopy trees from significant tree definition

As previously noted, there is also little justification for the exclusion of many tree species from the "significant tree" list. If the criteria for significant trees were to be applied consistently by the Applicant, at least seven more species would be added to the 11 listed. Inclusion of these seven additional species would add hundreds, and probably thousands, of trees to the number of "significant trees" to be felled.

2.16.5 Inadequate protection of bats during vegetation removal

As discussed in Section 3.10 above, the vegetation removal protocols prescribed in the revised ELMP place long-tailed bats at significant risk. The use of trees less than 50 cm diameter as bat roosts is well documented, but these are proposed to be

excluded from assessment. The loss of bat roosts, especially when bats are in residence with associated mortality, is a potentially significant adverse effect of the project. The methods for vegetation removal need to be revised so they are in line with current best practice.

2.16.6 No monitoring of bats during or post-construction

The application does not include any during or post-construction monitoring for bats to determine whether there are outstanding effects of road construction, or operation, on the activity, behaviour, or population size of either long-tailed or short-tailed bats and whether these effects are/can be addressed by mitigation. This is despite effects of roads on long-tailed bats being recently confirmed by research (Smith *et al.* 2017a). Other large scale roading projects in New Zealand (e.g. the Huntly Section of the Waikato Expressway) have adaptive management requirements for bats.

The ELMP states: “research suggests that measurement of no net loss for long tailed bats, lizards, and invertebrates may not be possible (refer to the monitoring section in Chapter 9 of this ELMP). This is not necessarily because the proposed measures will not result in a beneficial effect, but because the monitoring methods available are not necessarily able to detect it.” Wildlands does not support this opinion. There are methods available to measure population status and survivorship, including capture-mark-recapture studies. The Applicant should explain what they mean by the statement that “the monitoring methods available are not necessarily able to detect it” and reference the research that they are relying on in forming this opinion.

Part of the justification for a lack of post-construction monitoring has been that the effects of predator control on bats are well-known. However, predator control has only been confirmed as sufficient to increase survivorship of long-tailed bats and consequently population size, when it takes place over larger areas (i.e. greater than 3,000 hectares), O’Donnell *et al.* 2017 (p. 163) found that:

“long-tailed bat population growth rate was positive in the three study-colonies ($\lambda = 1.05-1.09$), with rat control using bait stations once the management area was sufficiently large (> 3000 ha; 2009/10, 2011/12)”.

The proposed area of pest control now exceeds this 3000 hectare threshold; however the outcomes for bats will be closely determined by the level of control achieved, and when this control is achieved. Previous control operations have failed to result in increasing bat populations if, post control, recovery of rat numbers occurred by November, when females form colonies and prepare to give birth (O’Donnell *et al.* 2017). The pest management plan should ensure, through the frequency and timing of pest control operations, that rat numbers will be sufficiently reduced at critical times of the year for bat populations. This will not be able to be determined with confidence in the absence of robust monitoring.

2.16.7 Unsupported or misleading statements

The revised ELMP continues to make unsupported or misleading statements regarding the likely benefits of the project. It is stated that the application uses “best available

science and the professional opinions of faunal experts” to support conclusions, but the science referred to is rarely, if ever, referenced, and some best practice guidance is not used. The application refers to fully forested valleys and the elimination of forest edges as being an outcome of this project, which will place a new road through a currently forested valley, creating substantial new edges. The extent of proposed pest control is at the lower end of spatial extent required to provide benefits for bats (based on best available science) for a site *without countering adverse effects*, e.g. loss of tree roosts, habitat fragmentation.

2.16.8 Lack of detail regarding location of mitigation sites

The ELMP is still partly conceptual due to uncertainty around land ownership and the location of restoration sites. This creates considerable uncertainty with regards to the likely conservation outcomes, and whether they do actually address the adverse ecological effects of the project.

This is a key issue for aquatic habitats. The total stream length to be restored cannot be confirmed until the offset reaches are known (and assessed). It could change significantly if there are changes in the width of the finalised restoration reaches. It is important that any tributaries earmarked for restoration purposes do not already have indigenous woody vegetation along their riparian margins, i.e. there needs to be a clear benefit as a result of restoration works along streams. A detailed map(s) should be included in the ELMP that clearly shows the location and lengths of each of the proposed offset reach.

2.16.9 Performance measures inconsistent or absent

The performance measures proposed will not consistently provide a measure of mitigation success. Meaningful performance measures should be designed that will assess success for all components of the proposed mitigation package. Performance measures should also ensure that they are not met at the outset, with no input required, to ensure that the mitigation proposed will result in meaningful, additional, and quantifiable, ecological gains. Wherever possible, performance indicators should be based on objective counts and/or measures that would allow independent verification of any claims made.

3. SUMMARY OF MAJOR OUTSTANDING ISSUES

3.1 Overview

Most of the key issues in the application were identified in the three previous reviews of the reporting (Wildland Consultants 2017a, 2017b, 2018), which were provided to the Applicant. These issues are repeated here only if they have not been addressed in the revised Ecology and Landscape and Management Plan, or in the S92 responses provided by the Applicant.

3.2 Understatement of ecological values

Assessments of ecological effects provided by the Applicant frequently understate ecological values. This is a result of either inappropriate grouping of vegetation or habitat types (e.g. including an area of kahikatea-swamp maire forest within an ecological values assessment of kahikatea forest, so that it is ranked as “High” not “Very High”), or not considering the fauna values when assessing the values of a vegetation type (e.g. ranking mānuka scrub that is gecko habitat as “Low”). Each Alliance ecologist provided a stand-alone assessment of effects for their respective specialist field, without the expected cross-over and integration required to assess the full significance of ecological effects associated with this project. A single coherent integrated assessment of ecological effects has not been provided by the Applicant. An assessment of ecological effects, by definition, should consider all of the biotic and abiotic components of the site as a whole and how they are to be affected and addressed.

3.3 No quantitative data to support claimed poor condition of forest to east of SH3

A key commonality between the specialist reports that comprise the application (with the exception of the aquatic assessment) is the argument that the eastern block is of lower ecological value due to the relative lack of pest animal control to the east of SH3 (relative to the Parininihi block, to the west of SH3, that has had 15 years of pest control). Whilst this difference in pest control history may be an appropriate generalisation for the route as a whole, it is problematic for the application for the following reasons:

- The lack of evidence presented regarding the relative forest condition of the tracts to the east and west of SH3. Field observations on 19 September 2017 indicated that at least northern rata to the east of SH3 (a browse-sensitive species) are in good health. The Applicant also notes that at least one area within the project area to the east of SH3 is in high ecological condition and of high ecological value. Quantitative data to support the Applicant’s view of lower ecological value has been requested but not provided.
- The Applicant also recognised in the draft assessment that further field work is needed to determine baseline forest condition (Vegetation report, Section 5.6).
- Quantitative data on differences in forest condition and tree health between the eastern and western sides of SH3 has still not been provided (e.g. foliar browse index, seedling ratio index), and is critical for justifying the mitigation approach taken by the Applicant.
- Referring to “the potential increase in vegetation condition” (S92 response, Point 68) without providing supporting data, means there is little assurance that the current vegetation is in poor health, and therefore has the potential to improve.
- The temporal nature of the assessment, given that the health of the forest to the east of SH3, if it is notably degraded, could be rapidly improved within 5-10 years if a pest control plan was implemented.
- The considerable weight that is being applied to differences in forest condition and health, as assessment criteria, is therefore dubious and is not supported based on the information provided to date.

3.4 Net loss of indigenous vegetation and habitats

The total area of 'offset and mitigation planting', including riparian planting, includes planting into existing areas of indigenous vegetation at some sites. The mitigation package should, as a minimum, ensure that there is no net loss on an area basis. This will require all plantings to be undertaken at sites that are not currently indigenous vegetation.

The Application also fails to consider the lag time between restoration plantings and the establishment of vegetation of similar composition, structure, and habitat value to the considerable area of vegetation to be lost. Normally this would be addressed by planting a larger area than the area to be lost, with this ratio considering the likely number of years/decades required to reach equivalence. The application does not do this, and uses a basic and minimalistic 1:1 replacement ratio for all vegetation loss to be addressed by plantings. Some of the forest vegetation is very old, probably centuries, and a minimum ratio of at least 1:2 would be expected (even that would be very conservative).

3.5 Mitigation that is not 'like for like'

The Applicant states that planting 200 seedlings for each "significant tree" felled is a one of three measures to address the residual ecological effects of the project (Ecology and Landscape Management Plan Section 3.5.4). Technical Report 7h Section 3.3.2 states that these will be of the same species as trees removed, but Section 4.6.2.3 of the draft and revised Ecology and Landscape Plan state that if these species fail due to hydrological reasons such as excessive flooding, "species more suited to the conditions will be planted". This could mean the plantings fail to meet the principle of "ecological equivalence" described by the Applicant in Technical Report 7h Section 2.1.2. To ensure ecological equivalence the Applicant should ensure that appropriate planting sites are available for each of the significant tree species affected. Furthermore, even if the same species are used, the ecological functions of mature trees are orders of magnitude greater than the seedlings and saplings to be provided, and it will take hundreds of years for plantings, if they survive, to achieve similar ecological functioning.

In a teleconference on 1 May 2018 between Wildlands and the Alliance, Mr MacGibbon stated that the significant tree plantings would be of the same species as those felled, and that he wasn't aware of the clause that allowed substitution. The Alliance agreed that this was an error, but it has not been corrected in the revised ELMP.

3.6 High likelihood of bat mortality during vegetation clearance

As discussed in Section 3.10 above, the Bat Management Plan does not adhere to the NZ Transport Agency bat guidance document (Smith *et al.* 2017). The 15 cm DBH limit on trees has been deleted, and an alternative vegetation removal protocol (VRP) has emerged that proposes implementing VRP requirements for trees greater than 80 cm DBH, and only for trees with DBH between 50 and 80 cm DBH if they have a restricted range of features that make them likely to be roosts. This greatly reduces the protection for bats that may use vegetation with DBH ≤ 50 cm. With this version of

the VRP there will be no protection of bats in any vegetation with DBH \leq 50 cm. This is highly likely to result in the mortality of long-tailed bats during vegetation clearance.

3.7 Lack of certainty that pest management approach will result in desired mitigation outcomes

In the draft Assessment of Ecological Effects, and the ELMP, the Applicant places considerable weight on pest management to address the adverse effects of road construction on vegetation and habitats, herpetofauna, lizards, birds, bats, and invertebrates.

Pest management could and should form a key part of the mitigation package. However the statement that the biodiversity offsetting area “currently receives very limited ecological management” (Technical Application 7h, Section 4.2.2) has been deleted in the Application without explanation. The Application should provide sufficient evidence that areas to be brought under active management as part of the mitigation package are currently unmanaged, to show that the proposed gains are real and additional, and would not have occurred if not for the Project.

No post-construction monitoring is proposed for some ecological components of the site (e.g. for bats, lizards, invertebrates) partly on the basis that the relationship between pest control and benefits to indigenous biodiversity is well-proven. Whilst this is correct in a broad sense, outcomes of pest control will be strongly influenced by site-specific variables and the methods used, including extent and timing. Given that most of the mitigation package is dependent on the proposed pest control resulting in ecological benefits, post-construction monitoring should be regarded as essential. Post-release monitoring is recommended in the Application for lizards salvaged during construction (Technical Report 7h, Section 3.6.2.1). Resource consent conditions should include comprehensive monitoring requirements for all components of the mitigation package.

3.8 Proposed mitigation and offsets package unlikely to mitigate or offset adverse ecological effects

The proposed mitigation and offsets package, as it currently stands, may not mitigate or offset adverse ecological effects. This is due to the very considerable scale of the adverse effects, a lack of adherence to best practice for the management of bats, and a lack of measurable performance measures and monitoring. Key limitations of the mitigation and offset package are summarised in Table 1.

Table 1: Assessment of proposed mitigation measures and mitigation objectives against current knowledge or best practice

Mitigation Proposed by Applicant	Desired Outcome as Stated by Applicant	Mitigation Requirements to Achieve Outcome, Based on Current Knowledge
3650 hectares of pest management.	Long-tailed bats increasing in number.	At least 3000 hectares (O'Donnell <i>et al.</i> 2017) ¹ . Success also closely determined by level of rat control achieved during the breeding season, which at present is poorly defined.
3650 hectares of pest management.	North Island brown kiwi population increasing.	11,000 hectares to maintain a viable population (Bass and McLennan 2003).
3650 hectares of pest management.	Offset indigenous vegetation loss.	Unknown. Dependent on vegetation condition within area of proposed pest control, and therefore what gains can be achieved. Unclear how pest control can offset loss of low palatability vegetation types (e.g. mānuka-tree fern-rewarewa forest).
Vegetation removal protocols for trees ≥50 cm to reduce bat mortality in roosts	No trees or vegetation containing bats is removed.	Vegetation removal protocols need to apply to all trees with potential roosts ≥15 centimetres diameter.
Mitigation plantings for younger vegetation.	One for one replacement plantings.	Ratio of at least 1:2 for vegetation loss: vegetation restored. Mitigation planting sites should not already be indigenous vegetation.
Offset plantings for swamp forest/ kahikatea.	Restoration plantings to address loss.	Possibly acceptable if accompanied by appropriate performance measures.

4. ADDITIONAL REQUIREMENTS FOR MITIGATION AND OFFSET MEASURES

The following additional mitigation and offset measures would substantially increase the likelihood that the adverse ecological effects of the project could be addressed:

- Strict adherence of vegetation removal protocols to current best practice, to reduce the likelihood that bat roost trees are felled while bats are present. This will require trees to be investigated as potential roosts if they are over ≥15 centimetres diameter (currently the ELMP states ≥50 cm diameter).
- Timing of control pulses for pest control should aim to achieve a significant reduction in rat numbers for the times when long-tailed bats are most vulnerable, e.g. in November.
- Plantings to ensure no net loss in area of indigenous vegetation, with a minimum of 1:2 loss to replacement ratio for all scrub/shrubland/forest habitats.

¹ O'Donnell *et al.* 2017 noted that smaller areas of pest control didn't result in quantifiable benefits for bats.

- Restoration of hillslope forest to offset the loss of 19.85 hectares of hillslope podocarp broadleaved forest (possibly by fencing and retirement from grazing of a much larger area).
- Define significant trees as per the Applicant's three point definition, with at least 200 seedlings of each of these species planted and associated with objectively-measured performance indicators.
- Retro-fitting any existing perched or broken culverts along the route to facilitate upstream fish passage.
- Adequate measures to reduce the mortality of kiwi due to vehicle collisions.

5. FURTHER INFORMATION REQUIRED

The following information was requested in the review of the draft ELMP, and these requests have not yet been met.

- All missing documentation noted in this report, e.g. Sheets 6-10 of Appendix A of ELMP, and the supplementary report detailing the herpetofauna predator management area.
- A quantitative assessment of forest condition and tree health to the east of SH3, including a canopy measure (e.g. Foliar Browse Index) and an understorey measure (e.g. Seedling Ratio Index)
- Maps showing existing vegetation types for all areas of proposed mitigation plantings. These will help determine if the plantings, together with the location and extent of the stream reaches proposed for restoration works, will result in habitat gain.
- Details of the location, vegetation types, size, management, and monitoring of the soft-release pen(s) for herpetofauna. Additional information is needed regarding how compensation activities (i.e. creation of rodent exclusion areas and enhanced habitats) will be separate and additional to mitigation activities, i.e. lizard salvage, translocation and pest control. This will need to address the significant areas of habitat where lizard salvage will not be possible/practical, and therefore where a compensation approach needs to be applied. Additionally, this will provide a measure to assess whether mitigation and compensation activities are likely to result in meaningful, long-term gains for herpetofauna.

6. REVIEW OF DRAFT DESIGNATION CONDITIONS

6.1 General comments

Until the project footprint has been fully surveyed, and extent of loss of indigenous habitats has been accurately quantified, the designation conditions should not state the extent of mitigation works required. Instead, ratios should be stated, so that final extent of loss can be offset by the appropriate quantum of mitigation. This would also recognise the inherent uncertainty in relation to the extent of planting area available.

As a minimum, the consent conditions should stipulate that the project results in no net loss of indigenous vegetation, on an area basis, and that the plantings to replace vegetation loss should be “like for like”. All mitigation plantings need to occur at locations where successful establishment will result in an increase in the extent of indigenous vegetation, e.g. exclude all areas of existing indigenous forest, shrubland, scrub, wetlands.

6.2 Designation Condition 28

Designation Condition 28 has not been revised to consider the recommendations of the previous review (Wildlands 2018). As such, the following comments still apply.

With regards to the how the ELMP will address ecological values, (a) vegetation/habitat (including wetlands) should specifically also include Threatened, At Risk or Regionally Significant plants.

Designation Condition 28 needs to include indigenous invertebrates in the list of ecological values to be addressed.

The designation condition refers to “herpetofauna (lizards)”, which therefore excludes frogs. All designation conditions regarding herpetofauna should refer to both lizards and frogs, by using the term herpetofauna. Additionally, the term ‘offset’ should be added to ‘avoid, remedy or mitigate’ in the herpetofauna management plan to address the areas where mitigation will not be possible.

The designation condition should stipulate that the ELMP will include all of the mitigation measures proposed in the Application, e.g. Section 3.3.2.1.

6.3 Designation Condition 29

Proposed conditions for the ELMP (Designation Condition 29) state that the mitigation shall include the pest management measures referred to in Condition 32. The ELMP should include a pest management plan that will achieve measurable biodiversity gains, with 1) the area of this to be determined by the area requirements of the indigenous fauna that will be adversely affected by the route, and 2) the timing of pest control pulses targeted to benefit the species most at risk (e.g. long-tailed bats).

The condition for the ELMP (29a) states that restoration planting should include six hectares of swamp forest and nine hectares with an appropriate mix of plant seedlings. The extent of plantings required should be reassessed once the project footprint has been fully surveyed. The designation conditions need to achieve no net loss of indigenous vegetation, on an area basis, and should stipulate that all mitigation plantings are undertaken in areas that are not currently indigenous vegetation.

Designation Condition 29 (a) (vii) describes “restoration planting”. All designation conditions should refer to the “*planting and successful establishment*” of these areas.

The condition for the ELMP (29a) (vii) (3) states that 200 seedlings are planted of the same species for each significant tree that is felled. The capture of significant trees

should be expanded to include other canopy tree species that are to be felled that meet the three point definition provided by the Applicant, but are currently omitted from the application. The designation conditions should require the successful establishment of these plantings. The consent conditions should specify that the species planted are like-for-like, e.g. 200 matai planted for every significant matai felled. The success of plantings should be documented by post-planting monitoring, with appropriate performance measures and contingency actions. Designation Condition 29 (a) (c) states that 90% survival of plants will be required *within* 6 years following planting. This is an error and should state “*at six years*”, otherwise the condition could be met immediately once planting has occurred, without factoring in post planting survival.

Designation Condition 29 (c) states, with regards to bats, that vegetation removal will be in accordance with the NZ Transport Agency research report 623. The bat management plan in the revised ELMP conflicts with this report, and the report is not a detailed prescription (i.e. it provides a framework into which details need to be inserted). As such, whilst the requirements of this report conform to best practice better than the revised ELMP, it is not adequate to refer to the research report as a consent condition.

A condition should be added addressing the action(s) required if an established kōkako territory/breeding pair was to be found within the Project footprint.

Designation conditions should specify details regarding temporary fences around construction areas, and permanent fences along the new road, to protect kiwi.

Designation Condition 29 specifies that the ELMP will include:

“Existing vegetation types for all areas of proposed mitigation plantings, to determine if these will result in habitat gain”

and

“the location and extent of the stream reaches proposed for restoration works”

These are not included in the revised ELMP.

6.4 Designation Condition 29(a)

Designation Condition 29(a) lists only three components of the ecological works that are to be monitored. The list should be expanded to include all of the monitoring proposed in the Application (Technical Report 7h Section 3.3.3) including:

- Monitoring of salvaged lizards post-release (recommended in the Application Technical Report 7h Section 3.6.2.1).
- Monitoring of stream diversions (recommended in the Application Technical Report 7h Section 3.7.3).
- Monitoring of the plant translocation trials (Section 4.4.2 of the ELMP).

Post-construction monitoring of bats should also be included as a designation condition, in line with best practice for major roading projects. Post-construction monitoring is recommended by the recently published NZTA framework document (Smith *et al.* 2017c) in order to determine the effectiveness of mitigation measures, and the Opus (2017) mitigation-focused report for this project suggests that monitoring will take place: “to determine if the target outcomes [of predator control] are being achieved (Section 4.4.2 Page 36)”. Consideration should also be given to carrying out fish surveys in the headwater tributaries upstream of new culverts to help determine if the new culverts are providing adequate fish passage.

Post-construction monitoring of translocated lizards into ‘soft-release’ pens and monitoring of resident lizard density responses within additional rodent exclusion areas should be included within the plan. These are critical assessment criteria for both mitigation and compensation activities.

The “relocation or cultivation of threatened plants found” has been deleted from Designation Condition 29 (a) (vii) (5). Has this been shifted or is there no condition that relates to this part of the mitigation strategy?

The consent conditions (Designation Condition 29 (a) vii 8 (a)) require planting to occur within three planting seasons of completion of works. The critical outcome here is not the planting itself, but the successful establishment of these plantings.

The designation conditions should be expanded to require maintenance of all plantings until canopy closure¹ with indigenous species has been achieved. Maintenance should be continued until restoration area targets have been met, including until 200 trees for each significant tree felled (subject to the larger list of what comprises a “significant tree”) have successfully established. This could be defined as the significant tree plantings increasing in height by at least 0.5 metres, and reaching an average height of two metres.

Post-construction monitoring of translocated *Gahnia* species should also be required. This is the only measure proposed to protect habitat for the forest ringlet butterfly (At Risk-Relict), should this species be present, and shifting of *Gahnia* species is often prone to establishment failure. The Designation Condition should require an assessment of the extent of *Gahnia* species within the project footprint, and specify the number or percentage of existing plants to be translocated, with an appropriate performance measure, e.g. 80% survival one year post-translocation.

6.5 Designation Condition 30(a)

Designation Condition 30(a) states that pre-construction vegetation monitoring will be undertaken to provide detailed baseline information on vegetation condition. As the core focus of the Applicant’s mitigation package is improvement of forest condition, by the implementation of a pest management plan, it is critical that this Designation Condition also requires post-construction monitoring of vegetation condition. If vegetation condition then does not improve, the mitigation package will have failed

¹ Canopy closure could be defined in the consent condition as 85% cover by indigenous species.

to meet its objectives, and alternative means of mitigating effects will need to be implemented.

Designation conditions should also incorporate the restoration of wetlands affected by failure of sediment or erosion controls.

6.6 Designation Condition 32

This designation condition has not been updated to reflect the increase in the extent of the pest management area (i.e. it refers to the former proposal of 1085 hectares).

Designation Condition 32 (a) states the PMP will address the methods proposed to monitor and control wasps along the road corridor, and Designation Condition 32 states that pest management will be in perpetuity. This is not currently fulfilled by the revised ELMP that states that invasive wasps will only be controlled along the road corridor during the construction period. Invasive wasps should be controlled in perpetuity, as required in Designation Condition 32, to address the permanent creation of forest edge habitats, that are favourable for wasps.

The pest management plan should be redesigned once the ecology of the project footprint, and of the proposed pest control area, has been fully surveyed. The Applicant should confirm the suitability of the pest control area to support the flora and fauna to be adversely affected by the project. To ensure that the objectives of the pest control have been met (e.g. benefits to herpetofauna and invertebrates), the core area of intensive pest control should include all introduced mammals, including mice, and wasps. Timing of pest control pulses should consider the timing of when these should be implemented to achieve the greatest ecological benefits, e.g. protection of maternal roosts for long-tailed bats.

7. CONCLUSIONS

The Application still includes missing documentation, and thus, at this stage, a full assessment of the ecological effects of the proposed works cannot be completed.

That said, evaluation of the existing documentation, as it stands, continues to raise significant concerns that are unlikely to be adequately addressed by the Applicant. Many of these issues have been raised in this review and in three previous reviews of the earlier documentation. These outstanding issues mean there is little assurance that significant adverse ecological effects will be meaningfully addressed.

The Application continues to place a heavy reliance on the implementation of a pest management plan to address the identified adverse effects of the proposed road. This remains very problematic for three key and interrelated reasons:

- The current pest management area does not include the control of wasps throughout the pest management area, or of mice, and these are likely to increase at the site due to the effects of road construction.

- Little or no monitoring is proposed to document the outcomes of pest control on indigenous fauna.
- The Application does not provide any quantitative evidence for the current condition/health of the forest in which pest control would be undertaken, and therefore the magnitude of ecological gain that could be made by implementing pest control. This quantitative evidence, and the importance of it, has been noted in all previous reviews of the Application. Without firm evidence of the current suggested poor state of the forest, and a pest management plan that is likely to result in measurable gains for the affected flora and fauna, little weight can be given to the mitigation proposed.

Over-reliance on the pest management plan to address adverse effects could have been addressed through the restoration of habitats to replace areas of vegetation loss, on a like-for-like basis. However, this is only proposed for younger areas of vegetation within the footprint (e.g. mānuka scrub) and areas of swamp forest. The maximum ratio used for area lost to area restored is a low 1:1, and some of the areas proposed for restoration planting are already areas of indigenous vegetation. The project may therefore result in a net loss of indigenous vegetation, with respect to both extent and ecological functioning. Any shortcomings of pest control for addressing the loss of older forests may not be addressed by plantings, e.g. the loss of hillslope podocarp broadleaved forest.

The Application also lacks certainty of outcomes due to the omission of performance measures for all components of the mitigation package. All parts of the proposed mitigation package need to be accompanied by a measurable performance measures, otherwise there is no legal requirement for the measures to be implemented. These performance measures need to be drawn together and evaluated as part of an integrated package of works to address the considerable scale of proposed adverse effects.

As noted in previous reviews, the Application continues to rely heavily on the opinions of the Applicant's ecologists to support key conclusions. This, in combination with misleading statements, means the Application understates the likely adverse effects of the project, and overstates the likely benefits of the proposed mitigation.

A critical change in the Applicant's documentation, with revisions to the draft ELMP, is the reduction in management requirements for long-tailed bats. This was unexpected, given the recent deterioration of conservation status for this species to "Threatened-Nationally Critical", its presence throughout the project footprint, and the likely presence of bat roosts within the areas of vegetation to be felled. The management proposed by the Applicant falls well short of best practice, and places long-tailed bats at high risk of mortality. The management of long-tailed bats for this project must adequately address direct mortality through felling of roosts and possible vehicle strike, and mitigate for habitat loss, habitat fragmentation, and roost loss through extensive pest management of appropriate scale and timing, and appropriate road design (e.g. lighting requirements). The Application as it stands is likely to have significant adverse effects on long-tailed bats.

The Application should be assessed again in full, when the revised documentation has been provided. This should include the missing information, correction of internal inconsistencies between the ELMP and designation conditions, and the changes that would arise if the previous reviews of the documentation were adequately addressed. As it currently stands, the Application provides little assurance that the project will adequately address the major potential adverse ecological effects of the proposed rerouting of SH3 at Mount Messenger.

ACKNOWLEDGMENTS

Rachelle McBeth provided client liaison for New Plymouth District Council.

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