SUMMARY STATEMENT – Soil management and land productivity – Dr Reece Hill

1. The detail of my assessment, including my effects assessment, is provided by my report *Soil Management Plan and assessment of soil related effects 134 Peach Island Road, Motueka.*
2. In my primary evidence dated 15 July 2022 I provide an overview of the key findings from my report. I also provide additional comments relating to my report, policy direction, permitted baseline, submissions and the s 42A report.
3. My supplementary evidence dated 4 November 2022 includes comments relating to the NPS-HPL and the Section 42A addendum.
4. Based on my assessment of the LandVision report and the regional soil and LUC map information, I consider the LandVision report to provide more detailed and accurate soil and LUC map information than the available regional scale soil and LUC map information for the site in question.
5. The soil descriptions provided in the property scale soil and LUC assessment by LandVision indicate that with the exception of soil type 3, all the other soils types on the Peach Island Road site are shallow or very shallow.
6. Based on the soil types and LUC units identified in the LandVision report, the soils on the Peach Island Road site are most likely to be less productive than deeper Riwaka soils in the surrounding area, especially where they are on land with LUC units 1s1 and 2s1.
7. I do not consider the land area outside the stop bank is not suitable for agricultural land development primarily due to flood risk.
8. The land inside the stop bank has soil limitations that restrict production and the range of land uses that it is suitable for over the long term.
9. These soil limitations are related to the shallow and variable soil depth to gravels which reduce rooting depth for orchard trees, restrict cultivation for arable use and increase the within site management requirements for production.
10. Adherence to the Soil Management Plan will ensure that the removal, management and placement of soil avoids or minimises impacts on the soil properties prior and following placement, and that the re-established soil can over the long term retain or exceed the soil versatility of the original soil on the site.
11. Following soil reinstatement, plant roots will be able to extend themselves through the total volume of the restored materials to seek nutrients and moisture.
12. Provided the relocated subsoil and topsoil is rock free, the resulting land should provide improved soil for cropping and horticulture.
13. Reduced site productivity and impacts on soil physical properties following reinstatement are anticipated in the short term (0-3 years). However, careful soil management throughout the operation and following reinstatement of the soil will reduce impacts on soil properties such that any impacts are likely to only be short term (0-3 years) while the pasture establishes and restores soil structure and soil biology.
14. Key to the effective re-establishment of the soil on the gravel extraction site are careful pre-planning, adherence to the guidance provided in the soil management plan, and the training of all staff involved, which are provided for in the Soil Management Plan.
15. Staging the gravel extraction reduces the loss of productive land on the site during the extraction of gravels and reduces the volume of soil requiring stockpiling and the time the soil is stockpiled.
16. Provided the activity is managed in accordance with the Soil Management Plan, the re-established soil is likely to remain productive at a similar level as the original soil and will have similar, or potentially have greater soil versatility than the original soil pre-gravel extraction.

17. Applying the Tasman Resource Management Plan (TRMP) definition for land of high productive value, the Peach Island Road site land **pre gravel extraction**, in my opinion, is not classed as land of high productive value. This includes land inside and outside the stop bank. This is also supported by the productivity assessment provided in Mr Nelson's evidence.
18. Following **reinstalment** of the soil profile, the land is likely to be classed as land of high productive value based on the Tasman Resource Management Plan definition.
19. Applying Tasman District's Productive Land Classification **pre gravel extraction**, only the LUC 3w1 land on the Peach Island Road site is classed as land suitable for cropping and horticulture. This is in agreement with the LandVision report. The wetness limitation of LUC 3w1 land means that the area will not be suitable for horticulture crops requiring well drained soils.
20. Applying Tasman District's Productive Land Classification **post gravel extraction**, the land suitable for cropping and horticulture will not be reduced by the proposed activities and could potentially increase post gravel extraction (providing the soil management guidance provided in the Soil Management Plan is adhered to).
21. Potential for soil loss to water is associated with soil storage, transport, preparation of the receiving surface, soil placement, and post placement management. Provided the guidance in the Soil Management Plan is followed, the risk of any soil loss to water from soil related activities is considered minimal, and any effects less than minor.

NPS-HPL

22. As set out in the diagram at p6 of the Soil Management Plan the site does not contain LUC 1 or 2 land. The site contains areas of LUC 3 land within and outside the stop banks. These are the only areas that the NPS-HPL applies to.
23. The land area outside the stop bank is not suitable for agricultural land development due to limitations of an inherent seasonally high water table, flood risk, and variable or shallow soil depth.
24. In my opinion, it has "permanent or long-term constraints … that mean the use of the highly productive land for land-based primary production is not able to be economically viable for at least 30 years", as per clause 3.10(1)(a) of the NPS-HPL.
25. As set out in my primary evidence, the LUC class 3 land inside the stop bank has soil limitations that restrict production and the range of land uses that it is suitable for over the long term. Adherence to the Soil Management Plan will ensure that the removal, management and placement of soil avoids or minimises impacts on the soil properties prior and following placement, and that the re-established soil can over the long term, retain or exceed the soil versatility of the original soil on the site.
26. Reduced site productivity and impacts on soil physical properties following reinstatement are anticipated in the short term (0-3 years). However, careful soil management throughout the operation and following reinstatement of the soil will reduce impacts on soil properties such that any impacts are likely to only be short term (0-3 years), while the pasture establishes and restores soil structure and soil biology.
27. Key to the effective re-establishment of the soil on the gravel extraction site are careful pre-planning, adherence to the guidance provided in the Soil Management Plan, including the training of all staff involved.
28. Staging the gravel extraction reduces the loss of productive land on the site during extraction of gravels and reduces the volume of soil requiring stockpiling and the time the soil is stockpiled. Provided the activity is managed in accordance with those recommendations, the re-established soil is likely to remain productive at a similar level as the original soil and will have similar, or potentially have greater soil versatility than the original soil pre-gravel extraction.

29. As a result, I consider that the activity can be considered a “temporary land use activity that has no [adverse] impact on the productive capacity of the land” in terms of clause 3.9(2)(g) of the NPS-HPL.

Section 42A addendum

30. In response to the opinion in the 42A report addendum about whether the site meets the TRMP definition of high productive value, I maintain that soil rooting depth (pre-gravel extraction) is a limiting factor across most of the site (LUC 3s1, 4s1, 5s1 and 6s1). The combination of features are not such that the land is capable of producing crops at *a high rate or across a wide range*.
31. My opinion is that the Peach Island Road site is predominantly LUC classes 4, 5 and 6 (as shown by the property scale soil and LUC assessment by LandVision), and as such, the site as a land unit is not LUC 3 as indicated by the regional scale NZLRI LUC map information.
32. If treated as a whole unit land for the purpose of assigning a LUC class the areas of LUC class 3 (LUC 3s1 and 3w1) are sub-dominant, and the site would be LUC class 4 (LUC unit 4s1) at best, based on property scale soil and LUC assessment provided by LandVision.
33. The examples of unsuccessful soil restoration in the region were primarily due to poor adherence to consent conditions and lack of a soil management plan, and do not mean that successful restoration cannot be achieved and the productivity capacity of the restored soil retained.
34. The provision of the Soil Management Plan and its correct implementation will prevent similar poor practices from occurring and ensure the productivity capacity of the restored soil on the site is at least retained.
35. In my opinion, the potential for degradation of soil aggregate degradation and compaction through irrigation of topsoil stockpiles and during transport of soil is likely to be minimal.
36. The restoration of the soil profile post gravel extraction with at least imperfect drainage meets TRMP requirements and is suitable for cropping and orchards. It does not equate to a degradation in productive capacity.