BEFORE THE INDEPENDENT HEARING PANEL

IN THE MATTER of the Resource Management Act 1991

AND of the proposed Timaru District Plan

Evidence of Clement Lagrue

on behalf of the Director-General of Conservation *Tumuaki Ahurei*

Hearing B: Rural Zones

Submitter No. 166 Further Submitter No.166

Dated: 5th July 2024

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Executive Summary of Key Points

1. It is not possible to provide ecological evidence on a proposed gravel extraction overlay in the Timaru District Plan without additional details being provided in relation to that proposal (in particular, location/map, extraction methods, and proposed plan provisions for the overlay).

2. In this statement I make four general propositions:

   (a) Gravel extraction takes place in various environments (active riverbeds, dry flood plains, agricultural land, etc), and the ecological delineation between these environments can be contentious. Purely land-based gravel extraction is technically rare. For gravel to be present indicates river influence.

   (b) We do not have accurate scientific data as to the location or quantities of gravel resources and supplies in Canterbury, or as to the sustainability of current harvesting.

   (c) The environmental effects of gravel extraction activities are highly site and method specific.

   (d) Research into the environmental effects of gravel extraction and the development of best-practice approaches has developed significantly in the last few years.

Introduction

1. My full name is Clement Lagrue.

2. I have been asked by the Director-General of Conservation Tumuaki Ahurei ('the D-G') to provide expert evidence on the proposed Timaru District Plan.

3. This evidence relates to Hearing B which includes Rural Zone provisions.

Qualifications and experience

4. I am employed by the Department of Conservation (DOC) as a Science Advisor Ecosystems. I have worked for DOC since October 2019.

5. I previously worked for the University of Alberta as a Lecturer in Ecology, the University of Otago, the Universities of Toulouse and Dijon (France) as a Postdoctoral Fellow in Ecology. I have experience in freshwater and terrestrial ecology conservation, as well as gravel extraction and management through my work with the Department of Conservation and my academic research.

6. I have a PhD in Biology from the University of Otago obtained in 2008.

7. I have worked in the gravel extraction and management space for 5 years through applied research on best practice to limit environmental impacts. I have provided advice in RMA processes and worked with a range of stakeholders and affected parties in respect of gravel management across Southland, Otago and Canterbury.

8. I have contributed to several internal DOC reports on gravel extraction and management practices, and supervised MSc theses of students assessing gravel extraction effects on freshwater biodiversity.

Code of Conduct

9. Although this is a Council hearing, I have read the code of conduct for expert witnesses as contained in the Environment Court's Practice Note 2023 (the Code). I have complied with the Code when preparing my written statement of evidence.

10. The data, information, facts and assumptions I have considered in forming my opinions are set out in my evidence to follow. The reasons for the opinions expressed are also set out in the evidence to follow.

11. Unless I state otherwise, this evidence is within my sphere of expertise, and I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

12. For the avoidance of doubt, in providing this evidence as an expert witness in accordance with the Environment Court Code of Conduct, I acknowledge that I have an overriding duty to impartially assist the Panel on matters within my area of expertise. The views expressed are my own expert views, and I do not speak on the D-G's behalf.

Scope

13. I have been asked to provide evidence in relation to the notified proposed Timaru District Plan, the D-G's submission (submitter number 166), and the D-G's further submission.

14. My evidence addresses the proposal for a gravel extraction overlay in the Timaru District Plan.

Material Considered

15. In preparing my evidence I have read and relied upon the following documents:

    (a) Relevant parts of the Proposed Timaru District Plan 2022.

    (b) The D-G's submission dated 15 December 2022 and further submissions dated 4 August 2023.

    (c) The relevant s42A Report.

    (d) Submissions proposing a gravel extraction overlay in the Timaru District Plan.

Gravel extraction

16. I have been asked to give evidence on the ecological effects of gravel extraction in Timaru, to assist the Hearing Panel in making recommendations on the proposed

Timaru District Plan (pTDP). I understand that a number of submissions on the pTDP propose that there be a gravel extraction overlay in the Plan. I do not have any details as to where any proposed overlay would be, what the proposed plan provisions would be for that overlay, or where and how the submitters' existing gravel extraction activities occur. Accordingly, I can only provide very generalised ecological evidence. If further details are supplied, I am of course willing to assist the Panel by providing more specific evidence.

17. There are four main propositions relating to gravel extraction that I would draw the Panel's attention to.

18. First, gravel extraction occurs in various environments e.g., within active riverbeds, dry flood plains, agricultural land, etc. The submitters proposing the gravel overlay state in their submissions that the gravel extraction overlay should apply: "*….**across** land where existing **land-based gravel extraction** and clean fill deposition occurs."*[1] The definition of land-based versus flood plain and / or riverbed extraction, and the ecological delineation between these environments, can be contentious. Where the bed of a river laterally ends and how far a flood plain extends is prone to interpretation. Purely land-based gravel extraction is technically rare. For gravel to be present indicates river influence.

19. Second, we do not have accurate scientific data as to the location or quantities of gravel resources and supplies in Canterbury (or across New Zealand), with the potential exception of a few major waterways. Assessment of gravel budgets across a system is expensive, (traditionally) technologically complex, and rarely done. Further, the sustainability of gravel harvesting (regardless of the environment it is extracted from) is very rarely monitored or reported upon. I am not aware of any such data and trend monitoring (e.g., LiDAR imaging of riverbed gravel levels) in the area covered by the Timaru District. LiDAR monitoring documents bed-level over time and allows the identification of gravel aggregation or degradation areas, thus informing strategic gravel extraction in terms of areas and volumes. Without information on existing or planned gravel extraction in this area, and data on existing resource availability across the landscape, and replenishment in river environments (as gravel is only replenished via erosion in the headwaters and longitudinal movement in waterways), it is not possible to assess whether the resource is being managed sustainably and / or to assess the

[1] See for example Submission No. 174, Rooney Holdings Ltd.

potential effects of extraction on indigenous biodiversity values and the wider environment.

20. Third, the appropriateness and potential environmental effects (positive or negative) of gravel extraction activities are both site and method specific, with added factorial effects. For example, extraction via pit mining may be acceptable for some land-based operations but have extremely negative ecological effects during river-based extraction, and thus be unacceptable in such an environment. Appropriate management and site rehabilitation approaches will also vary drastically across sites and environments. Other variables to consider when assessing the ecological impacts of gravel extraction activities include the nature of the vegetation cover (indigenous flora versus invasive species), presence of an overburden layer and disposal of said overburden, presence of birds, lizards and other native wildlife (along with their threat status), accessibility of site, and method of gravel extraction (beach skimming versus pit mining). Gravel habitats, either in or alongside rivers and on land, are key habitats for many native and threatened species. Gravel beds in rivers contain many invertebrate and fish species, and dry gravel bars and islands on riverbeds are key nesting habitats for many threatened bird species (banded dotterels, black fronted terns, etc.). Dry gravel habitats are used by endemic lizards and plants. This list is not comprehensive and other site-specific factors often come into consideration. Providing advice on gravel extraction activities and their ecological effects must therefore be done in the full knowledge of each site-specific situation. Given the lack of information on what the proposed *gravel extraction overlay* intends to achieve and where it is planned to apply, the ecological effects of the proposal cannot be evaluated.

21. Fourth, in addition to the general points above, the Department of Conservation has been leading research over the last 8 years into gravel extraction effects on biodiversity. The aim of this research is to develop best practice approaches to limit the adverse ecological effects of both land and river-based gravel extraction. Using that data and engaging with affected parties and stakeholders in other districts/regions, has led the Department to revise previous advice on gravel extraction, demonstrating the relatively recent advances in scientific knowledge relating to gravel extraction. For example, until recently, pit mining and the creation of habitat ponds as a rehabilitation tool were seen as the best methods to combine gravel extraction and limit environmental effects of the activity. However, research from the Department of Conservation, in collaboration with the University of Otago, shows that this approach has significant negative effects on water quality and does not provide habitats suitable for native species. Alternative

extraction approaches are being designed and tested from a terrestrial (birds) and aquatic (fish and invertebrates) perspective. They are showing positive results and may be applicable across the Timaru District. More information about the proposed gravel extraction overlay is needed to assess whether this would allow new gravel extraction approaches to apply so that environmental effects are best mitigated.

Summary

22. I have set out four core general propositions in relation to gravel extraction. Until I am provided with further information on locations, extraction methods and volumes to be harvested, it is not possible to provide specific expert evidence on the ecological impacts of the proposed *gravel extraction overla*y in the Timaru District. However, if these details were forthcoming, I would of course be willing to assist the Panel further.

Dr Clement Lagrue

DATED 5th July 2024