BEFORE THE INDEPENDENT HEARING PANEL APPOINTED BY THE QUEENSTOWN LAKES DISTRICT COUNCIL

UNDER	the Resource Management Act 1991 (RMA)
IN THE MATTER	of the Te Pūtahi Ladies Mile Plan Variation in accordance with section 80B and 80C, and Part 5 of Schedule 1 of the Resource Management Act 1991.

STATEMENT OF REBUTTAL EVIDENCE OF JOHN FRASER GARDINER
10 November 2023

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Introduction

1 My full name is John Fraser Gardiner. I am a Director of Candor[3] consultants.

2 I prepared a statement of evidence on behalf of Queenstown Lakes District Council (**QLDC** or **Council**) dated 29 September 2023 on the submissions and further submissions to the Te Pūtahi Ladies Mile Plan Variation (**TPLM Variation**). My evidence considered the civil engineering matters related to the area subject to the TPLM Variation (the **TPLM Variation Area**) including the context and restraints of the TPLM Variation Area from a land development engineering perspective, stormwater management and earthworks.

3 I have the qualifications and experience as set out at paragraphs 6 and 7 of my statement of evidence dated 29 September 2023.

4 I repeat the confirmation given in my evidence that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023, and that my evidence has been prepared in compliance with that Code.

Scope of rebuttal evidence

5 In preparing this rebuttal statement, I have read and considered the evidence filed on behalf of submitters as that evidence relates to my evidence. I also attended the expert conferencing session for stormwater and infrastructure on 1 November 2023 and have also read and considered the Joint Witness Statement produced at that expert conferencing session.

6 In this evidence I limit my responses to the management of stormwater from the TPLM Variation Area and make limited comment as to the disposal of stormwater from the Anna Hutchinson Family Trust land. I respond to the:

(a) Statement of Evidence of Warren Ladbrook on behalf of the Anna Hutchinson Family Trust (107) dated 20 October 2023.

(b) Statement of Evidence of Warren Ladbrook on behalf of Glenpanel Development Ltd (73) dated 20 October 2023.

(c) Statement of Evidence of Richard Regan on behalf of the Anna Hutchinson Family Trust (107) dated 20 October 2023.

(d) Statement of Evidence of Jana Davis on behalf of Kāi Tahu (100) dated 20 October 2023.

(e) Statement of Evidence of Michael Bathgate on behalf of Kāi Tahu dated 20 October 2023.

(f) Statement of Evidence of Mike Hanff on behalf of Friends of Lake Hayes Incorporated (39) dated 20 October 2023.

(g) The experts' joint witness statement (**JWS**) on infrastructure and engineering, dated 2 November 2023.

7 I have also reviewed the rebuttal evidence of Ms Amy Prestidge dated 10 November 2023 in preparing my evidence.

Stormwater

8 There was a high degree of alignment between the experts that attended the expert conferencing being myself, Amy Prestidge, Warren Ladbrook and Richard Regan in relation to stormwater. The JWS Attachment A summarises the agreements reached in sections 1 through 5.

9 In the following section of my evidence, I comment on some points that are recorded in the disagreements/reservations column of Attachment A of the JWS:

(a) I agree with Mr Ladbrook that the different timing and sequencing of land development is a challenge in determining appropriate solutions / approaches.[1] On further reflection I think some elements of a stormwater solution suggest themselves as being the answer and in this sense are more rigid / fixed than others. With the preparation of a Stormwater Management Guideline (**SMG**), designers and Council can be provided with a framework that will allow robust decision making to successfully coordinate and manage an holistic stormwater solution across the TPLM Variation Area.

(b) Because the TPLM Variation requires a collector road through the area from east to west it is an anchoring "backbone" feature within the TPLM Variation Area that traverses many of the land holdings.

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[1] Joint Witness Statement for Stormwater and Infrastructure, dated 2 November 2023, at Attachment A, section 1(a).

If one is to capture and manage stormwater from Slope Hill it follows that this is probably best done by constructing a swale on the Slope Hill side of the collector road to capture and control stormwater runoff from Slope Hill.

(c) It is recognised that land is valuable and that developers will wish to minimise how much land has to be set aside for stormwater devices. Furthermore, Council have to maintain any devices over the long term and it is also sensible to minimise the size of devices from this perspective.

(d) While some treatment of runoff from Slope Hill may be desirable I note that Slope Hill is a natural feature that the developers are not modifying and therefore any treatment of the stormwater runoff from Slope Hill is a 'bonus' and cannot necessarily be required of developers.[2]

(e) The variation in soakage rates across the TPLM Variation Area was discussed and agreed at the expert conferencing. The witnesses all agreed it is reasonable to account for this during detailed design.[3] Closer to Slope Hill there is a more significant "crust" of soil material overlying deeper, more free draining gravels. It is possible to design any swale alongside the collector road to rely on soakage through the "crust" material for smaller storm events (up to the 5% Annual Exceedance Probability (**AEP**) event for example) but to have overflow shafts that access the free drainage gravels below the soil crust where higher soakage rates can be utilised to dispose of runoff in larger storm events up to the 1% AEP event. This will allow the profile of a swale alongside the collector road to be minimised but still deliver the required performance. It is considered that the appropriate place to document tools / approaches such as this in a SMG where diagrams / drawings can be included for reference.

(f) While it will be up to individual developers to design and build sections of the collector road (including a swale) I believe that with appropriate engineering and a sensible array of engineering

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2 Joint Witness Statement for Stormwater and Infrastructure, dated 2 November 2023, at Attachment A, section 1(a).

3 Joint Witness Statement for Stormwater and Infrastructure, dated 2 November 2023, at Attachment A, section 1.

methods documented in a SMG it will be possible for individual developers to move forward and develop at different times but that ultimately a coherent connected solution to manage runoff from Slope Hill can be delivered.

(g) Secondary flow paths will also be required as is prudent engineering practice to allow for unforeseen events (blockage or failure of a stormwater management device resulting in overflows) or runoff from events greater than the suggested 1% AEP design storm event. As the natural landform flows west to east, Lake Hayes may receive some overflow runoff but only in extreme or unforeseen events which is what would occur even if no development were to occur within the TPLM Variation Area.

(h) Warren Ladbrook notes under section 1b of the JWS that coordination and planning associated with secondary flow paths should not adversely impact the sequencing or time associated with the consenting, design and construction on any property. I agree that this is desirable and believe that a SMG is an appropriate place to document a coordinated planning framework for designers and Council to work to that allows development to occur in a fragmented way but ultimately delivers a coordinated connected stormwater outcome.

(i) At section 2 of the JWS I make the point that it is not possible to dictate to each landowner what “method” to use. On reflection this statement is not as clear as it might have been. It was agreed that allowing some flexibility to landowners and their designers was appropriate and the discussion of methods included the possibility of landowners using underground tanks to store stormwater before soakage disposal. This is certainly possible and led to a discussion about maintenance and other constraints such as not building tanks under roads or utility services. This discussion reinforces my view of the need for a SMG where acceptable tools can be outlined with guidance as to acceptable use, etc. I address underground tanks for stormwater disposal further below in the context of Mr Ladbrook’s evidence in support Glenpanel Development Limited’s submission.

(j) Warren Ladbrook under section 2 of the JWS also notes “that spatial arrangement of land ownership is not always conducive for

collaborative stormwater solutions…". I agree however this situation is worsened where no documented framework for decision making is in place and different parties operating in a vacuum may derive different solutions without consideration of the wider context. The more I consider the matter the stronger my view that a robust framework for decision making (including through the use of a SMG) will provide consistency and enhance the chance of minimising devices across the TPLM Variation Area while allowing landowners to proceed at different times and taking into account topography and other key matters.

10 In terms of the preparation of the SMGs, I understand that the planners have questioned how these would be formulated and whether they could be based on existing resource material such as the *Te Ao Maori and Water Sensitive Urban Design.*[4] In my experience it is not unusual for Guidelines that sit outside a District Plan to be prepared. I consider that these could be done in consultation with affected landowners and stakeholders. The SMGs would cover the detailed engineering assessments that are required to ensure integration (including of stormwater management devices and flowpaths) but the document could also be expanded to include other matters including some of the components in existing resource material such as the Te Ao Maori and Water Sensitive Urban Design document.

Anna Hutchinson Family Trust stormwater

11 With regards to the evidence provided in relation to the Anna Hutchinson Family Trust I note that this area was out of scope for the work that I have carried out on the TPLM Variation Area, being in a different catchment. However, based on the location of the land and the topography it is possible to say that a stormwater disposal system could be provided for the land in one form or another.

Glenpanel Development Limited stormwater

12 Regarding Glenpanel Development Limited's (**Glenpanel**) land and the evidence of Mr Ladbrook I respond to paragraphs 21 24 of his evidence

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[4] *Te Ao Maori and Water Sensitive Urban Design,* Natural Science Challenges, September 2019 - https://www.landcareresearch.co.nz/assets/Discover-Our-Research/Environment/Sustainable-society-policy/WSUD/Te-Ao-Maori-and-water-sensitive-urban-design.pdf

where he discusses the possibility of utilising underground tanks for stormwater disposal as follows.

(a) At the expert conferencing the location, configuration and maintenance requirements of devices such as underground tanks was discussed. It was agreed that it is not appropriate to have tanks under roads or to have utility services run over the top of tanks. This is appropriate in my opinion, as future maintenance or repair would be costly.

(b) While underground tanks may possibly prove useful in some circumstances and should not be discounted as an option (and have been added to the Information Requirement 27.7.28.1(b)(ii)) I do not believe that tank layouts as discussed in Mr Ladbrook's evidence or shown in the plans accompanying that evidence are appropriate. If repair or maintenance were required, roads would have to be closed to allow works to be carried out and traffic management and other costs would be prohibitive.

(c) It is also difficult to get runoff from a 1% AEP event into underground tanks given the quantum of flow likely to be generated from the development. It is my view that tanks sited under areas of open space that are dedicated to a stormwater function might be appropriate to help reduce the size of the device but I foresee problems trying to have large underground tank networks aligned within road corridors even where these are widened for the specific purpose of having tanks laid beneath them. While I do not discount the use of tanks, I would not support them as a suitable tool for stormwater disposal within road corridors within the TPLM Variation Area.

13 Ms Prestidge has made comment in her rebuttal evidence in response to questions raised by the Planning JWS, as to why the DN1050 Howards Drive stormwater pipe is not covered as a solution in her evidence. Candor[3] did consider the use of the DN1050 pipe in early calculations but as Ms Prestidge says "there is limited capacity in the DN1050 Howards Drive pipe" and agreements are in place as to who can use this

capacity.[5] It was discounted as a solution because of its limited capacity and I agree with Ms Prestidge's evidence.

14 I have also reviewed Ms Prestidge's evidence in response to questions raised by the Planning JWS about a secondary flow path for the Slope Hill catchment. I agree with her comments about secondary flow paths and that it is likely that two secondary flow paths will exist within the TPLM Variation Zone, but only one would exit the site towards Lake Hayes.

Other evidence

15 I have reviewed the evidence of Mr Davis and Mr Bathgate for Kāi Tahu (100), and Mr Hanff for Friends of Lake Hayes Incorporated (39). I make comment on this evidence as it relates to stormwater management.

Evidence of Mr Davis for Kāi Tahu

16 Paragraph 24 of the cultural evidence Mr Davis for Kāi Tahu advocates for an integrated approach to catchment management.

17 I agree with this statement and as I have commented in various paragraphs within this rebuttal evidence I believe that the preparation of a SMG for the TPLM Variation Area will go a long way towards ensuring that integrated stormwater management is implemented and that collaboration occurs between parties. A SMG of necessity would require looking at the TPLM Variation Area holistically when decisions are made as to location and size of devices and to the linking of secondary flow paths.

Evidence of Mr Bathgate for Kāi Tahu

18 Mr Bathgate, in paragraph 52 of his evidence supports an integrated stormwater management approach as was set out in the original Te Pūtahi Ladies Mile Masterplan (**TPLM Masterplan**). However neither QLDC nor landowners are in a position to lead the implementation of the approach set out in the original TPLM Masterplan and consequently an alternative solution had to be developed.

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5 Rebuttal evidence of Amy Prestidge – Stormwater – dated 10 November 2023, at paragraph 23.

19 The development of an alternative solution is a balancing act between a proliferation of devices installed on individual land holdings by each developer or a more integrated approach that limits the number of devices across the TPLM Variation Area but is more flexible than the original masterplan solution. 'Four devices' was selected as a reasonable number of devices across the TPLM Variation Area for an alternative approach. Through the expert conferencing process it was agreed that managing runoff from Slope Hill in a swale as a separate exercise was sensible (page 5 of Attachment A of the JWS). This swale would constitute one device. My opinion is now that four devices across the areas to be developed for housing, in addition to the swale, is reasonable (i.e. five devices in total).

20 Through the expert conferencing process the concept of an SMG has arisen which, if implemented, will be able to provide a framework for sound decision making along the lines of an integrated approach and which will ensure consistency over the longer term. I note that Mr Bathgate at paragraph 59 of his evidence points out the uncertainty of delivery of an integrated system due to fragmentation, different processing officers, etc. In my opinion a robust SMG will alleviate many of these problems which is why my opinion is now that such a document is necessary. I leave it to others to determine how it is integrated into planning documents or QLDC standards if it is decided that such a document has merit.

Evidence of Mr Hanff for Friends of Lake Hayes

20 I have read the evidence of both Mr Hanff and Ms Prestidge regarding the natural topography of the land and where stormwater runoff would naturally flow if State Highway 6 (**SH6**) did not exist. Having built a 3D model of the TPLM Variation Area and worked with it for an extended period while developing stormwater disposal solutions I agree with Ms Prestidge as to topography. Mr Hanff is incorrect in his suggestion on page 3 of his evidence where he suggests that SH6 is preventing flows from falling to the south. Stormwater runoff from the bulk of the TPLM Variation Area naturally flows to Lake Hayes.

21 On page 2 of his evidence under point 2 of his scope of evidence, Mr Hanff refers to the wealth of scientific evidence available about the state of Lake Hayes. I do not disagree that there is a wealth of evidence available. In developing stormwater solutions for the TPLM Variation

Area I have accessed Otago Regional Council reports, in particular those which state that the aquifer underlying the TPLM Variation Area flows away from Lake Hayes. This information very much informed the process that arrived at ground soakage as the ideal solution as it will divert stormwater flows away from Lake Hayes in all except extreme events, rather than towards it. Logically this is likely to reduce the nutrient loading that may currently be reaching Lake Hayes.

22 It is also important in any design to assess the risks of failure of the system and to ensure that safeguards are in place should something unforeseen occur. Designing for very extreme storm events that have a very low probability of occurring is also inefficient and burdens communities with costs that are inappropriate given that the design life of materials used in construction is limited. By way of example designing for storm events that have a probability of occurring once every 200 or more years is inappropriate when pipes have a design life of 50 – 100 years. Providing secondary flow paths as a safety measure is simply prudent engineering and as the natural topography falls towards Lake Hayes any secondary flowpath system must of necessity run towards Lake Hayes and in rare cases some overflow may occur.

23 QLDC standards require primary networks to be designed to cater for the 20% AEP. In this case the stormwater solution proposed is requiring primary systems to be designed to cater for the 1% AEP, a considerably higher bar. This was deliberately chosen to reduce any impact on Lake Hayes.

Conclusion

24 The issues raised by the submitters are valid but have been addressed in the stormwater disposal solution promoted and balance the needs of all parties to the greatest degree possible, in my professional opinion. Delivering suitable stormwater infrastructure to support the development of the TPLM Variation Area is achievable and from my perspective I am of the opinion that stormwater considerations are not an impediment to approving the TPLM Variation.

25 As Ms Prestidge noted in her evidence “Coordination of three waters infrastructure across all development blocks (including those outside of TPLM) remains an essential step towards efficient servicing and

operation".[6] This is most important in delivering a suitable stormwater solution and I believe that the introduction of a SMG can provide a robust framework for the delivery of an holistically considered integrated stormwater solution.

26 While of concern to some submitters it is essential to provide secondary flow paths as a safety measure to protect property in the event of an extreme storm event occurring or some unforeseen event that causes a failure within a stormwater management device that triggers some overflow.

27 Due to the natural topography, any overflows from activation of secondary flow paths will run to Lake Hayes which sits at the bottom of the natural catchment. There is no pragmatic way to avoid this in my professional opinion.

John Fraser Gardiner

10 November 2023

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6 Statement of Rebuttal Evidence of Amy Catherine Prestidge dated 10 November 2023, at paragraph 48.