Before a panel appointed under the Fast-Track Approvals Act 2024 **FTAA-2510-1120**

UNDER:	the Fast-track Approvals Act 2024 (**Act**)
IN THE MATTER:	an application for approvals for the Lake Pūkaki Hydro Storage and Dam Resilience Works
BY:	**MERIDIAN ENERGY LIMITED** **Applicant**

STATEMENT OF EVIDENCE OF SAM HEGGIE-GRACIE AND DEAN MILLER ON BEHALF OF MERIDIAN ENERGY LIMITED

Terrestrial and wetland ecology assessment

Dated: 15 April 2026

Counsel acting:
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INTRODUCTION (Sam Heggie-Gracie)

1. My full name is Samuel David Heggie-Gracie.

2. I am a Senior Ecologist at Tonkin & Taylor Ltd (T+T).

3. I hold a Bachelor of Science in Ecology, Post Graduate Diploma in Biosecurity and Consevation and Masters of Science in Biosecurity and Conservation from the University of Auckland. I am a member of the Ornithological Society of New Zealand and the Society for Research on Amphibians and Reptiles in New Zealand.

4. I have been practising as an ecological consultant for 9 years. Prior to working at T+T, I was employed as an ecologist at Auckland Council.

5. My specialist expertise includes terrestrial and wetland ecology. I hold a personal survey permit for native lizards in the Auckland region.

6. I have been asked by Meridian Energy Limited to provide a response to the specific matters contained in the written comments on the application from persons invited by the Panel to comment under section 53 of the Act:

    a. Department of Conservation (DOC)

    b. Canterbury Regional Council (CRC)/Environment Canterbury (ECan)

7. I have prepared this statement within the limited time available to me. Consequently, it is necessarily at a high level. I am able to provide a more fulsome response on the issues covered in this statement if the Panel requires further assistance.

CODE OF CONDUCT

8. I confirm that I have read the Code of Conduct for Expert Witnesses as contained in section 9 of the Environment Court Practice Note (2023), and have complied with it in preparing this evidence. I confirm the issues addressed in this evidence are within my area of expertise, and I have not omitted material facts known to me that might alter or detract from my evidence.

INTRODUCTION (Dean Miller)

9. My full name is Dean Craig Miller.

10. I am employed as a Principal Freshwater Ecologist at Tonkin & Taylor Limited ('T+T') and have been with T+T for 24 years. I specialise in resource evaluation and management work in freshwater environments with specific areas of expertise in freshwater ecology and ecological impact assessment.

11. I hold the qualifications of Bachelor of Science and Master of Science and Technology with First Class Honours in Biological Sciences, from the University of Waikato. I am a member of the New Zealand Freshwater Sciences Society.

12. I am considered a co-author, and Technical Reviewer regarding wetland-related matters (Paragraphs 20 to 25) of this evidence.

CODE OF CONDUCT

13. I confirm that I have read the Code of Conduct for Expert Witnesses as contained in section 9 of the Environment Court Practice Note (2023), and have complied with it in preparing this evidence. I confirm the issues addressed in this evidence are within my area of expertise, and I have not omitted material facts known to me that might alter or detract from my evidence.

Department of Conservation Section 51(2)c response – Wildlife Permit

14. I (Sam Heggie-Gracie) provide the following responses to the Section 51(2)(c) wildlife approval report prepared by DOC, for the FTAA-2510-1120 Lake Pūkaki Hydro Storage and Dam Resilience project.

15. DOC considered that there was no clear methodology proposed for lizard relocation. The following actions are proposed in response to DOC comments.

    1.15.1 The Lizard Management Plan (LMP)[1] has been amended to include detailed salvage and relocation methods for the North Stockpile.

[1] Tonkin & Taylor Ltd. (December 2025). Lake Pūkaki Fast Track Consent Substantive Apploication. Lizard Management Plan. Prepared for GHD Limited. 1097626v2.

1.15.2 Salvage methods will include Artificial Cover Object (ACO) deployment and salvage, pitfall trapping, funnel trapping and manual habitat searches.

1.15.3 Relocation methods will include capture, handling and transport, relocation site description, and release methods. Salvaged lizards will be released approximately 1 km south of the North Stockpile, east of the Pūkaki River, where suitable habitat was identified during the initial lizard survey during November 2025.

1.15.4 Following establishment of the lizard exclusion fence at the North Stockpile, lizard salvage will be implemented during the lizard salvage season (October to April inclusive) during suitable weather. Where the North Stockpile requires utilisation for rock armouring before October 2026, a 'best endeavour' approach will be used to salvage lizards from the North Stockpile. I recognise that such a salvage event would be outside the typical salvage season. It may therefore be less effective, or potentially ineffective if weather conditions are not conducive to capturing and relocating lizards. Lizard injury and mortality may occur and adverse effects are acknowledged. However, given the potential timeframes in which the lake may be low enough to allow armouring, I consider this an appropriate best endeavour approach to minimise impacts to lizards. The compensation proposed (see Paragraph 1.16.1) accounts for potential injury and mortality for lizards across the project.

1.15.5 Following salvage, lizards will be excluded from entering the North Stockpile by the exclusion fence.

1.15.6 Where practicable, the best endeavour approach will attempt salvage during suitable weather conditions. However, given the potential salvage time of year (e.g. winter), standard weather constraints may not be able to be met. Salvage methods may need to be modified to minimise lizard mortality (e.g. day-trapping only if overnight temperatures are very low, or a focus on manual habitat searches). These modifications have been outlined in the amended LMP.

1.15.7 Lizard survey across the North Stockpile will be repeated every 10 years over the duration of the permit where stockpile material has not been utilised to assess if lizards have managed to re-colonise the stockpile (considered unlikely given the fencing and salvage proposed). If they have, an additional salvage in accordance with the LMP will be required.

1.15.8 If rock stockpiles remain at the South Stockpile after 10 years, a survey will also be conducted across this area to confirm lizard species presence.

1.15.9 Salvage from the South Stockpile is not proposed due to the inability to exclude lizards from re-colonising the site. Were a salvage to be undertaken, immigration from surrounding habitats would continue to occur, making the salvage ineffective. Based on the advice of Meridian the site operates as a working hydroelectricity site of national significance. The ongoing addition of material to the stockpile means that the presence of fences would impede their operations and create unnecessary constraints. Lizard injury and mortality is acknowledged at this site as an adverse effect, to be addressed by way of compensation (Paragraph 1.16.4).

16. Regarding the lizard compensation proposal, DOC considered the compensation should comprise $125,000 for the first year of removal of remaining live trees and dead tree material in the identified compensation sites. In addition, DOC considered follow up removal of regrowth would be required which is likely to cost between $30,000 and $40,000 annually, or at a minimum every two years. My response to these matters is as follows:

1.16.1 Provided the updated lizard salvage methods for North Stockpile are implemented as set out in Paragraphs 1.15.2, then the potential for residual effects on native lizards is reduced. However, some adverse effects remain (loss of lizard habitat, potential for lizard injury and mortality at the South Stockpile and access tracks), and I consider the original proposed compensation amount ($30,000) to be appropriate, with an additional $10,000 where Mackenzie skink

(or any other Threatened species) are detected in the North Stockpile[2].

1.16.2 The area for wildling conifer control proposed by DOC equates to approximately 40 ha. Given the loss of approximately 7.3 ha of stockpile habitat, DOC's proposal equates to habitat enhancement 5 x larger than the area of potential impact.

1.16.3 In my opinion an equivalent amount of habitat enhancement as that impacted (low to moderate quality habitat of 7.3 ha) is appropriate and commensurate with the adverse effects on Not Threatened and At Risk lizards that have colonised stockpiles specifically established for dam resilience works. The compensation enhancement will also benefit the Threatened Mackenzie skink.

1.16.4 Based on the cost of $125,000 wilding conifer management provided by DOC over a 40 ha extent, the costs of wilding conifer control over 7.3 ha would be approximately $21,000. The remaining amount in the compensation fund of around $7,000 is proposed to be used to undertake follow up control every 2nd year for 10 years. Overall, I consider the compensation approach proposed by Meridian to be commensurate with the amount and quality of habitat impacted by the works and adverse effects to lizards.

17. DOC notes it is also possible that Lake's skink (*O. aff. chloronoton* "West Otago"; Threatened – Nationally Vulnerable) may also be present nearby. My response is as follows:

1.17.1 The baseline lizard survey methods and effort were appropriate for the species present, and DOC has previously acknowledged this. I consider it highly unlikely that Lake's skink would be present.

1.17.2 As it is difficult to prove an absence, including the Lake's skink on the list of species potentially affected by works and potentially relocated should be included as part of the Wildlife Approval for the very low, but residual risk of this species being captured or impacted by works.

[2] As per T+T, 11 February 2026, Lake Pūkaki Fast-track Consent Substantive Application post-lodgement ecological response to Department of Conservation feedback. Prepared for Meridian Energy limited.

18. DOC noted that the lizard survey covered only the areas directly affected by the proposed dam-armouring works at Lake Pūkaki, leaving periodically exposed habitats unassessed and creating uncertainty about the full impact on lizard populations.

1.18.1 A desktop assessment was conducted to identify lizard populations in the wider environment, which are outlined in the EcIA (Table 4.4).

1.18.2 I acknowledge that lizards would inhabit lake margins. Lake margin lizard surveys were undertaken as part of the Waitaki Power Scheme (WPS) re-consenting and lizards were typically recorded inhabiting scrubland margins, and rarely, cobble margins (Pers. Comms. Dr. Graham Ussher). In addition, Statement of Evidence by Katherine Muchna for the WPS re-consenting[3] noted that lizards were not observed around the wetted margin of Lake Pūkaki where the substrate was comprised of large, irregular cobbles with little vegetation cover.

1.18.3 Under the existing baseline scenario/current regime, lizards would be affected by existing fluctuations to the lake level. It is therefore considered that the eased access, which is proposed for short durations and over three years, would not pose an adverse impact over and above the existing baseline condition (which would incur lizard deaths during lake fluctuations).

1.18.4 Of the species present in the wider environment, the Southern Alps gecko (At Risk – Declining) is the most likely species to inhabit and migrate into lake margins based on surveys and observations as part of the WPS re-consenting (Pers. Comms. Dr. Graham Ussher).

1.18.5 The likely time of year of the drawdown would typically be outside the active lizard season when lizards are in torpor (and therefore not moving into the lake margins). The lake would generally rise during spring/summer snowmelt, during the active lizard season when lizards could potentially move away from the rising lake (as also noted by K. Muchna[3].

[3] Muchna, K. (28 May 2025). Statement of Evidence of Katherine Julie Muchna – Herpetofauna (Lizards) ENV-2024-WLG-00006.

1.18.6 Finally, given the short drawdown duration (most likely scenario drawdown of 39 days over 3 years), I consider an increased likelihood of lizard mortality (e.g. above baseline/existing scenario conditions) occurring directly due to the additional eased access to be highly unlikely.

19. DOC noted there are no standard lizard exclusion fencing specifications. In response it is proposed to implement the Canterbury spotted skink (*Oligosoma lineoocellatum*) lizard fencing methodology and specifications implemented at Orana Wildlife Park. The LMP has been amended to include these methods and specifications for the North Stockpile. These specifications can also be provided on request.

20. DOC considered that significant residual effects will remain even where an exclusion fence is installed and wilding pine control is implemented.

1.20.1 In my opinion, provided the implementation of lizard salvage across the North Stockpile, as well as the implementation of a lizard exclusion fence around the North Stockpile, and the compensation fund of $30,000 to manage wilding conifer, then residual adverse impacts to native lizards are sufficiently addressed.

Environment Canterbury – Dr. Jean Jack response and Department of Conservation – S53 Amelia Wilkonson

21. We have reviewed Dr. Jean Jack's technical advice[4]. we have also reviewed DOC's S53 response[5], and Dr. Susan Walker's evidence[6].

22. Dr. Jack (Environment Canterbury) and Dr. Walker (DOC representative) consider potential adverse effects on wetlands could occur if the lake level is drawn down for an extended period. These include the very high value Tasman Delta and turf wetlands. Both habitats are ecologically significant and support Threatened and At-Risk plant species.

23. Dr. Walker also note that high lake levels are likely to be important to maintain the functioning of other wetlands with low hydrological connectivity to the lake.

[4] Envirnment Canterbury Regional Council (21 November 2025). Appendix 5: Terrestrial biodiversity (including wetlands, avifauna) technical expert advice.
[5] Department of Conservation (8 April 2025). Comment on the Lake Pūkaki Hydro Storage and Dam Resilience Work application
[6] Statement of Evidence of Susan Walker (8 April 2026). Terrestrial Ecology.

24. DOC acknowledges in their response that fluctuating lake levels are necessary for turf communities to persist, and periodic inundation is required to exclude taller invasive weed species (3.3.14). This is also true for vegetation across the Tasman Delta. We agree with this and note that the eased access scenario if it occurs, will be for short periods of time, for a time-bound period of three years and for shorter periods than anticipated under the PC1 baseline assumptions. Wetlands, including turf communities have formed and adapted to the baseline existing environment lake level regime and associated water level fluctuations. In the event the lake was drawn down blow 518 m RL during the 3-year period the wetland turf communities would be expected to recover following a return to baseline lake fluctuations. Inundation of these wetlands is also likely to occur during the period of the eased access scenario.

25. Eased access hydrological modelling predicts the lake will be held below 518 m RL approximately 3% of the time. Any drawdown would be generally of a short duration (days) and not deep (not below 515.0 m) (GHD, 2025)[7].

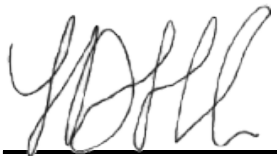
26. As outlined in Amy Callaghan's evidence[8], a monitoring agreement is already in place with DOC in relation to monitoring of *Isolepis basilaris* (a wetland turf species classified as Nationally At Risk – Naturally Uncommon) in the Tasman Delta. This species would provide a useful indicator regarding how turf species are responding to the eased access scenario. The agreement requires Meridian to notify DOC when they are about to manage the lake below 518 m RL and to fund monitoring of *I. basilaris*. Given the expected low level of effects on wetlands based on the likely short duration of eased access and time-bound period of three years, we consider this monitoring sufficient to provide further information on how turf species (see above, this species would be a useful indicator species) respond to the eased access scenario.

27. The EcIA uses the EIANZ Ecological Impact Assessment Guidelines[9] as a framework to assist in determining the magnitude of effect and overall level of effects due to the drawdown of the lake below 518 m RL. In our opinion the low magnitude of effect described in the EcIA is appropriate for describing any

[7] GHD (2025). Technical Memorandum. Lake Pūkaki FTC. Phase 1 Technical Assessment – Update. Prepared for Meridian Energy.
[8] Statement of Evidence on behalf of Meridian Energy Limited – Amy Callaghan (15 April 2026).
[9] Roper-Lindsay, J., Fuller S.A., Hooson, S., Sanders, M.D., Ussher, G.T. (2018). Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.

potential temporary effect to wetland habitats. Any change to wetland habitats will be temporary (e.g., short and not deep) and once water levels return to within the baseline existing environment operating range, the wetland habitat composition and attributes of the turf communities would be expected to return to the pre-lowering scenario. Overall, we confirm that our assessment in the EcIA stands, and that the proposed lowering of the water level will result in an overall low to very low effect on wetland habitats.

Dated: 15 April 2026



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