Before the Expert Panel appointed under the Fast-track Approvals Act 2024

Under	the Fast-track Approvals Act 2024 (**Act**)
And	
In the Matter of	an application for approvals by Matakanui Gold Limited to establish, operate, rehabilitate and ultimately close an open pit and underground gold mining operation known as the Bendigo-Ophir Gold Project

Statement of Evidence of **Ian Kenneth Grant Boothroyd** on behalf of **Matakanui Gold Limited** in response to Section 53 Feedback

Aquatic Ecology

Dated: 17 April 2026

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INTRODUCTION

1. My name is Ian Kenneth Grant Boothroyd.

2. I am a Partner at Boffa Miskell Limited, Auckland. I hold the qualifications of BSc (Hons) Zoology (University of Manchester, UK), MSc Applied Hydrobiology (University of Wales, UK), and DPhil Freshwater Ecology (University of Waikato, NZ).

3. I have over 30 years' experience of assessing ecological and resource management matters in New Zealand and overseas.

4. I am an elected Fellow of both the Royal Society of Biology (**FRSB**), and the Environment Institute of Australia and NZ (**FEIANZ**), a Certified Environmental Practitioner and a member and Past-President of the New Zealand Chapter of the Environmental Institute of Australia and New Zealand. I am also a former President of the NZ Freshwater Sciences Society and a former elected Councillor of the Royal Society of New Zealand.

5. Previously I have worked for the University of Auckland, Golder Associates (NZ) Limited, National Institute of Water and Atmospheric Research as well as the Hawke's Bay and the Waikato Regional Councils.

6. My areas of expertise are in ecology (especially freshwater ecology), the assessment of impacts of developments on aquatic and terrestrial resources, assessments of the value of and significance of freshwater and terrestrial environments, and the restoration and mitigation of any environmental effects.

7. I have co-authored several national protocols for aquatic management and assessments including instream monitoring[1], and instream habitat assessments (including riparian assessments)[2]. Most recently, I co-authored the award winning[3] 'Guidelines for Ecological Impact Assessment in New Zealand', published by the Environment Institute of Australia and New Zealand.

8. I have prepared and presented evidence in Council hearings and before the Environment Court on behalf of public and private organisations in respect of several development projects as well as in relation to planning documents.

[1] Stark, J. D., Boothroyd, I. K. G., Harding, J. S., Maxted, J. R., Scarsbrook, M. R. 2001: Protocols for sampling macroinvertebrates in wadeable streams. New Zealand Macroinvertebrate Working Group Report No. 1. Prepared for the Ministry for the Environment.

[2] Harding, J., Clapcott, J.E., Quinn, J.M., Hayes, J.W., Joy, M.K., Storey, R.G., Greig, H.S., Hay, J., James T., Beech, M.A., Ozane, R., Meredith, A.S., Boothroyd, I.K.G. 2009: Stream Habitat Assessment Protocols for Wadeable Rivers and Streams of New Zealand. University of Canterbury.

[3] RMLA Best publication 2016.

9. This statement is given as part of Matakanui Gold Limited's (**MGL**) response to comments on the Bendigo-Ophir Gold Project (**BOGP**) made under Section 53 of the FTA. This statement responds to specific comments raised by:

   (a) The Minister for the Environment.

   (b) Otago and New Zealand Fish and Game Councils.

   (c) Sustainable Tarras.

10. I have also reviewed the aquatic ecology matters raised by other commenters and have sought to address and incorporate those points in my responses below.

11. My original findings are provided in full in the report:

   (a) B.18 Boffa Miskell - Assessment of Freshwater Ecological Effects (Boffa Miskell 2025a).

12. My report should be read in conjunction with:

   (a) Bendigo Ophir Gold Project: Assessment of Effects on Aquatic Habitat. Report prepared by Water Ways Consulting, June 2025.

   (b) Bendigo Ophir Gold Project: Surface Water & Catchment Existing Environment & Effects Assessment. Report prepared by Kōmanawa Solutions Ltd., May 2025.

   (c) Bendigo Ophir Gold Project: Landscape and Ecological Rehabilitation Management Plan. Report prepared by Manaaki Whenua, Habitat NZ, Boffa Miskell, July 2025.

13. I have prepared this statement in the limited time available for MGL to respond to comments under the Act. If the Panel requires elaboration on any of the matters raised in this statement, I am available to provide further information on request.

14. Although this is not an Environment Court proceeding my confirmation of compliance with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023 is included in Substantive Application Document A0.2B.

SPECIFIC RESPONSE TO COMMENTS

Minister for the Environment

Issue 7: The application states incorrectly that provision for fish passage is not required. The National Policy Statement for Freshwater Management 2020 and the National Environmental Standards for Freshwater 2020 require any new in-stream structures to provide for fish passage unless specifically excluding pest species.

15. The National Policy Statement for Freshwater Management 2020 (**NPS-FM**) and the National Environmental Standards for Freshwater 2020 (N**ESF**) require that new instream structures provide for fish passage.

16. In section 8.2 of the Assessment of Freshwater Ecological Effects (BML (2025) I comment that the provision for fish passage and habitat is not a necessary requirement for the diversion channel as fish are absent from the Shepherds Creek and Rise and Shine Creek.

17. I make this comment as a purposeful provision for the creation of a functioning aquatic ecosystem as a remedy for the loss of watercourses resulting from the BOGP. The purpose of the remedy is to provide for a similar or enhanced functioning ecosystem that reflects the main components of the existing watercourse. I consider that maintains the absence of fish from the created watercourse.

18. Komanawa (2025) set out the context for the watercourses at BOGP:

    (a) Shepherds Creek does not extend as a perennial water course to its main stem at the Lindis River. Instead, Shepherds Creek is lost to soakage through its bed a full 3 km short of the confluence with the Lindis River, thereby replenishing the Ardgour Alluvial Aquifer, which itself seeps into the Lindis River.

    (b) Rise and Shine Creek is a small tributary of Bendigo Creek.

19. In their report, Waterways (2025) confirm that no watercourses within the Project Site have fish residing in them. This is due to the presence of several barriers to upstream and downstream fish passage in the Shepherds Creek catchment, which include the approximately 3 km lower ephemeral reach of Shepherds Creek which flows very infrequently and the existing water abstraction structure within Shepherds Creek.

20. I note that A.11 Section 4 – Approvals Sought (Section 4.7) of the Substantive Application sets out the approvals in respect of complex fisheries activities being sought by the BOGP that would otherwise be required under the Freshwater Fisheries Regulations. In the case of the BOGP it is considered that there is no requirement for the various diversion structures and culverts to include a fish facility, and a dispensation is being sought accordingly.

21. I also note that A.11 Section 4 – Approvals Sough (Section 4.7) of the Substantive Application also sets out that MGL proposes to install a culvert in the bed of Rise and Shine Creek within the Project Site. While fish passage has been demonstrated to not be a relevant consideration (due to the absence of any fish upstream of this location), detailed culvert design (in accordance with the relevant information requirements in the NES Freshwater) will be provided following the installation of the culvert to ensure baseline flows can continue to be provided. Proposed conditions relevant to this culvert design are provided in the recommended conditions presented as Appendix 02 of comments from Otago Regional Council.

Fish and Game Council

Issue 7*: *As proposed, the Project will have significant adverse effects on aquatic life, contrary to s 107 RMA

Issue 2: The Project has not adequately assessed the receiving environment, which is a critical first step in assessing environmental effects

22. Waterways (2025) provided a comprehensive assessment of the aquatic receiving environment of Shepherds Creek and Rise and Shine Creek which is sufficient to inform an assessment of freshwater ecological effects and for the application of the effects management hierarchy. Along with the respective assessments of water quantity (Kōmanawa 2025) and water quality (Ryder 2025) I consider that the receiving environment was assessed in sufficient detail to respond to relevant statutory planning documents (and the corresponding policies, rules and regulations) and to apply the effects management hierarchy, to reach a conclusion of no net loss of watercourses and that any potential effects on aquatic ecology values are less than minor.

23. The effects of the BOGP on downstream surface water and groundwater environments is provided in Kōmanawa (2025) and the ecological effects are addressed further in my evidence below.

Issue 5: The Project is situated upstream of waterbodies that have good water quality and significant freshwater values, both in terms of their instream values (trout fishery, indigenous fish) and human use values (irrigation, frost control, drinking water). The applicant has not assessed the Project's impacts on those values.

Issue 21: Fish in the wider receiving environment are not described in the application materials. Mr Trotter observes that in favourable flow conditions the lower Lindis River, downstream of the crossing, supports some large longfin tuna (eels) and the occasional galaxiid fish.

Issue 24: The application and supporting documents assess the project site itself. The application documents have not assessed the current state or values of receiving waters beyond the site.

Issue 47: The Lindis River at Ardgour Road ORC state of the environment monitoring site is within the area likely to be most affected by the plume of contaminants in groundwater emanating from Shepherds Creek. The future environment as modified by the full implementation of resource consents granted subject to minimum flow requirements coming into force in October 2026 should be considered. The addition of contaminants from the BOGP to the lower Lindis will create multiple stressor impacts (cumulative effects). These contaminants should be assessed as discharging to an important fishery with a reasonable minimum flow and improved fishery and angling amenity values.

Issue 66: Adverse effects on macroinvertebrates impact higher up the food chain as sources of food for trout and other fish are diminished.

Issue 67: To maintain a 'good' state of macroinvertebrate community health in the lower Lindis River and Bendigo Creek requires a more precautionary approach to understanding and managing the concentrations and loads of contaminants entering those aquatic ecosystems.

Issue 76: Fish and macroinvertebrate effects may be significant if contaminants discharged from the BOGP reach the lower Lindis River, Bendigo Creek, and Mata-au Clutha River at concentrations set out in the compliance limits (Ryder 2025) or greater (which may be the case if seepage is not controlled effectively)

24. In their submission, Fish and Game Council raise a number of issues pertaining to potential impacts of BOGP on waterbodies downstream and connected to the Project site. These are set out in the issues above I have grouped my response to these issues together.

25. I note that Kōmanawa (2025) describe the hydrological characteristics of the downstream and surrounding catchments. In my opinion, whilst little commentary has been made by technical experts of the aquatic ecological values of these downstream environments, the protections applied to the upper reaches along with the dilution provided by the greater volumes of flow downstream provides sufficient protection against any impacts downstream.

26. By way of summary, the Lindis River rises in the low ranges to the north of the Lindis Pass and is bounded by the Ahuriri catchment and the Dunstan Ranges to the east and to the west by tributaries of Lake Hawea. Most of the Lindis catchment consists of agricultural grasslands. As a result of the very dry climate in the lower catchment where much of the high-producing pasture and cropping is located there is heavy demand for water abstraction from the lower third of the Lindis River, and I understand that existing levels of allocation can contribute to the drying of the lower Lindis River most years.

27. Five species of native fish and two sports fish have been recorded in the Lindis catchment. Native species recorded include[4]: longfin eel (*Anguilla dieffenbachii*), koaro (*Galaxias brevipinnis*), Clutha flathead galaxias (*Galaxias sp. D*), common bully (*Gobiomorphus cotidianus*) and upland bully (*Gobiomorphus breviceps*). The introduced species present are brown trout (*Salmo trutta*) and rainbow trout (*Onchorhynchus mykiss*).

28. I emphasise that no fish occur at the location of and upstream of the BOGP in the upper reaches of Shepherds Creek and Rise and Shine Creek.

29. Macroinvertebrate[5] communities at sampled sites within the Lindis River are typically dominated by mayfly and are generally indicative of very good water quality and habitat. I note that the periodic drying of the lower reaches of the Lindis River will contribute to fluctuations in the magnitude and quality of the ecological values.

30. In a study of the Lindis River by Otago Regional Council (ORC 2016), macroinvertebrate communities were found to comprise a mix of tolerant and sensitive species but made up of commonly occurring species.

[4]Otago Regional Council (2008) Management Flows for Aquatic Ecosystems in the Lindis River. Otago Regional Council, Dunedin.
[5] Small animals without backbones that are visible to the naked eye.

31. Although likely to be variable in abundance during different seasons and in variable river conditions, representatives of key feeding types[6] were apparent within the macroinvertebrate community reflecting a typical, if simplistic[7], natural ecosystem functionality.

32. None of the species occurring in the study samples are listed as threatened or of conservation interest.

33. As the macroinvertebrate communities are adapted and resilient to the current environment and to the persistence of the existing multi-stressors, I do not expect any additional adverse effects on macroinvertebrates higher up the food chain beyond what is occurring currently. Accordingly, I do not expect that food availability for trout will be diminished because of the proposed BOGP.

34. Whilst the macroinvertebrate metrics resulting from the samples reflect good to high water and habitat quality, the macroinvertebrate communities are not exceptional and reflect common species and communities found elsewhere in New Zealand.

35. I also note that in her review Ms McArthur also acknowledges that for the multi-stressor environment of the lower Lindis River, the drying of the riverbed, and particularly stresses from increased temperatures and lowered dissolved oxygen, are the more likely causes of lowered macroinvertebrate metric returns.

36. In his response to comments from Fish and Game, Dr Ryder states that Clutha River / Mata-Au provides a significant source of dilution for any flow (and associated contaminants) entering the Clutha River itself or Lake Dunstan from the Lindis River or from Bendigo Creek, or directly via groundwater[8].

37. Notwithstanding the good to high ecological value of the downstream aquatic environments, that are comprised of commonly occurring species and low to moderate species diversity, and simple trophic functionality, along with the already multi-stressor environment of the downstream environments, including the loss of surface water flows at times of the year, I expect that any impacts of water quality changes resulting from the BOGP operations to be very low, and unlikely to be discernible from other stressors.

[6] Variety of different gazing types, filter feeders and predators.
[7] Simplistic = only few species and levels of feeding structure, as opposed to a more multi-level complex trophic structure.at each
[8] Para 10, Response to s53 comments, dated 17 April 2026.

Issue 33 The limits have been set at 90% species protection – the level recommended for "highly disturbed" systems - based on an inaccurate depiction of the condition of streams within the Project site that is not even supported by the applicant's own sampling and analysis.

38. Ms McArthur comments on the application of a 90% species protection limit to the water quality standards and goes on to state that these are not consistent with healthy macroinvertebrate communities and that sensitive species may be lost.[9] I am not clear what is meant by 'lost', but in his evidence, Dr Ryder confirms that setting a compliance limit equivalent to a higher than 90% level of protection (i.e., 95% or 99%) may not be able to be met currently. He goes on to state that there is little point in setting water quality limits that cannot be met under the existing environment. I concur with this conclusion.

39. In response to comments from Fish and Game, Dr Ryder presents data that shows that the potential contaminant contributions that may enter the lower Lindis River, or the Clutha River, under median flow conditions do not threaten ANZG (2018) Default Guideline Values (**DVGs**) for 95% or even 99% level of species protection.

40. Furthermore, I agree with Dr Ryder[10] that, given the multi-stressors on the downstream environment, as acknowledged by Ms McArthur, and the knowledge of the ecological values, in that the watercourses in question at the locations of potential effects, are not pristine or near pristine to justify a high level of species protection as defined by the ANZG (2018) guidance.

Issue 22: Groundwater ecosystems (stygofauna and biofilms) in receiving groundwater are not described in the application materials. Water from the Project's receiving environment is relied on for human uses including drinking water, irrigation and frost protection.

Issue 69: Stygofauna and microbial biofilms in aquifers are adversely affected by elevated nitrogenous contaminants, toxicants and metals, as well as low oxygen conditions. The applicant has not assessed stygofauna impacts.

Fish and Game comment on the groundwater dependent ecosystems of indigenous aquatic species, or the stygofauna and biofilms that exist within aquifers. The stygofauna are small invertebrates adapted to living in aquatic environments underground.

[9] Para 55, Statement of Ms McArthur, dated April 2026.
[10] Para 12, SoE of Dr Ryder in response to RoI, dated 17 April 2026.

Little is known of the stygofauna in New Zealand, but recent studies have revealed that endemism seems to be high, with all taxa regionally endemic.[11]

41. No specific studies were undertaken of the groundwater ecosystems downstream of the BOGP. However, I note that in his evidence, Dr Ryder states that the recommended ammonia and nitrate compliance limits are intended to protect against the toxicity effects of these elements. Although the toxicity of these elements on stygofauna is unknown, I consider that the compliance limits applied by Dr Ryder should be protective of groundwater fauna as they are for surface water aquatic fauna.

42. In his evidence, Dr Ryder provides a further analysis of contaminant loads, over time, reaching the lower Lindis River, Clutha River / Mata-Au and Lake Dunstan that shows that ecological values will be protected.

43. Dr Ryder goes on to confirm that, despite the low likelihood of water quality contaminants having a meaningful impact on the wider freshwater environment, he supports the recommendations for monitoring put forward in the evidence of Mr Rekker in relation to the Lindis River and Bendigo Creek. In his evidence, Dr Rekker states that the intention of the proposed surface water monitoring of the receiving environments is they could be monitored and a baseline obtained for trend line analysis. I understand that for the Lindis River, the sampling would dovetail into existing ORC State of Environment Monitoring and extend the list of analytes. This makes good sense and I concur with the inclusion of this proposed additional monitoring.

44. I agree with Dr Ryder that these monitoring actions can sit in a management plan and not in the proposed updated conditions. I understand that updated management plans are not being provided at this time and will instead be reissued following expert conferencing.

Sustainable Tarras

Issue 59: Project will result in loss of river extent.

45. As set out in the Boffa Miskell Assessment of Ecological Effects, I consider that the application of the effects management hierarchy in the NPS-FM is satisfied, and with the application of offset and compensation measures, no net loss of river extent is achieved.

[11] Fenwick GD, Greenwood MJ, Hogg ID, Meyer SJ. 2021. High diversity and local endemism in Aotearoa New Zealand's groundwater crustacean fauna. Ecology and Evolution 11(22): 15664-82

With the rehabilitated stream diversions plus provision of stream enhancement measures, and additional compensation (management of willows and rehabilitation of Bendigo and Clearwater Creeks), there is no permanent loss of streams or any loss of overall extent of watercourses. Streams are either replaced within a short timeframe (ecologically functional diversions) or re-established and rehabilitated later (Mt. Mocha Creek) or separately, Bendigo Creek and Clearwater Creek are subject to specific management (willow management and rehabilitation). In my opinion this is an acceptable outcome and meets the provisions of the relevant policies of the NPS-FM and regulations of the NESF.

Ian Kenneth Grant Boothroyd

17 April 2026