**Before a panel appointed under the Fast-track Approvals Act 2024** **FTAA-2504-1046**

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| **UNDER** | the Fast-track Approvals Act 2024 (**Act**) |
| **IN THE MATTER** | an application for approvals for the Waihi North Project (**WNP**) – a listed project described in Schedule 2 of the Act |
| **BY** | **OCEANA GOLD (NEW ZEALAND) LIMITED Applicant** |

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# STATEMENT OF EVIDENCE BY IAN KENNETH GRANT BOOTHROYD ON BEHALF OF OCEANAGOLD (NEW ZEALAND) LIMITED

**Freshwater ecology**

**Dated 1 September 2025**

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## Introduction

1. My full name is Ian Kenneth Grant Boothroyd. My qualifications and experience, and my role in the Waihi North Project (**WNP**), are set out in my statement of evidence dated 26 February 2025 included in Part G of the substantive application document for the WNP.

2. I have been asked by OceanaGold (New Zealand) Limited (**OGNZL**) to provide a response to the specific matters contained in written comments on the WNP application from persons invited by the Panel to comment under section 53 of the Fast-track Approvals Act 2024 (**Act**). Those persons are:

    a. Department of Conservation;

    b. Coromandel Watchdog;

    c. Forest and Bird;

    d. Waikato Regional Council; and

    e. Tangata Whenua.

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

## Code of conduct

4. I confirm that I have read the code of conduct for expert witnesses contained in section 9 of the Environment Court Practice Note 2023 and have complied with it in preparing this evidence. I confirm that 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 (DOC)**

5. DOC have reached a view that the potential reduction in groundwater discharge of approximately 33% is likely to have a net-negative impact on the Gladstone wetland.[1]

6. Both GWS (2021)[2] and GHD (2022)[3] have indicated that a reduction in catchment and groundwater inflow may result in a less frequent saturation of the wetland. At section 9.1.5, of the Freshwater Ecological Assessment Report, I summarise the findings of the key hydrological and groundwater assessments pertaining to the Gladstone Wetland.[4] A level control at the outlet of the wetland provides for water saturation in the wetland and buffers the wetland against more frequent periods of drying.[5]

7. The effects of these changes on Gladstone Wetland are detailed in section 16.1.5 of the Freshwater Ecological Assessment Report. I have relied on the findings of both GWS (2021) and GHD (2022), and I conclude that as there are unlikely to be any direct or indirect (hydrological) effects on the Gladstone wetland, no loss of extent or values of the wetland is anticipated.[6]

8. DOC seeks clarity on the extent and purpose of non-ecologically functioning sections of diversions.[7] For the avoidance of doubt, the entire Ruahorehore Stream Diversion will be a channel that conveys water from the upper to lower catchment. For the lower part of this diversion (1,800 m), the diversion will be designed following design principles for stream diversions in Appendix 4, examples of cross-sections of the indicative diversion channels in Appendix 11, along with a Draft Stream Diversion and Development Plan

1 Department of Conservation comments on Waihi North project, at paragraphs [53] - [54].

2 GWS 2021. Gladstone Hill Wetland – Interpretation of Hydrogeologic Conditions and Potential Effects from the Proposed Gladstone Open Pit. Technical memo prepared by GWS Limited dated 21 July 2021.

3 GHD 2022C. Gladstone Wetland Groundwater Assessment Summary. Technical Memorandum prepared by GHD Ltd., dated 21 January 2022.

4 B.43. *Freshwater Ecological Assessment* part 1, at section 9.1.5.

5 B.43. *Freshwater Ecological Assessment* part 1, at section 16.1.5.

6 B.43. *Freshwater Ecological Assessment* part 1, at section 16.1.5.

7 Department of Conservation comments on Waihi North project, at paragraph 58.

in Appendix 14 of the Freshwater Ecological assessment Report.[8] I refer to this outcome as an ecologically functional watercourse as it will be designed and built to those specifications.

9. Where I refer to a 'non-ecologically functioning' diversion (i.e., the upper reaches of the Ruahorehore Stream diversion), this means that the channel is not required or expected to reach a level (or at least the same level as the lower reaches) of ecological functionality. The upper part of the diversion is expected to be very steep and perhaps narrow in parts, and the ability to formulate effective and value-add instream and riparian components would be limited.

10. Accordingly, and to prevent any misrepresentation that function might be created, I considered this upper section as a cleanwater channel. That is, it conveys water from upstream to downstream just as any watercourse would, but there is little (but not none) opportunity to create a watercourse of ecological value in the circumstances. The 'no ecological value' perhaps overstates the intention but was said to clarify that this was not included in any assessment of gains in ecological values of the watercourse.

11. DOC state at paragraph 59 that it is 'unclear what ecological functions will be lost'. For the avoidance of any doubt, no ecological values will be lost. Simply, the upper part of the Ruahorehore diversion is not included as a gain in any calculations for the offset or compensation for the loss of ecological values from the replaced stream. All ecological values that are replaced are accounted for in the Stream Ecological Valuation (**SEV**) calculations, but the upper Ruahorehore diversion is not included in the calculation of gains.

8 Noting that Appendix 4 is contained in part 1, and Appendices 11 and 14 are contained in part 2, B.43. *Freshwater Ecological Assessment*.

12. On the other hand, because it conveys water and connects the upper and lower sections of the watercourse, the upper Ruahorehore diversion length is included in calculations of stream extent.

13. In part, this also responds to paragraph 117 of DOC's comments on the WNP. The exclusion of the upper Ruahorehore diversion is not a shortfall in the calculations for offsetting, it is simply excluded from the calculations for the reasons expressed above. It would be remiss to include this section as it is not considered appropriate as replacement for lost values. All lost values are included in the SEV calculations and there is no shortfall.

14. DOC comment on the replacement of streams back into their original locations once the mining is completed.[9] That is incorrect. At Willows Farm, Tributary 2 will be diverted and overburden placed over the original stream channel. At a later stage, but prior to mining ceasing, the overburden will be removed, and the watercourse will be rehabilitated in its original (or near to) channel. Tributary 2 is an intermittent stream and is the only watercourse where there will be two perceived instances of complete loss of values. No other watercourses where original channels have been replaced with diversions will be returned to their original channels.

15. The diversion of Tributary 2 is expected to continue as an intermittent watercourse and to function as a clean water channel. For clarification, any loss of extent and values of Tributary 2, albeit temporary (over a long period of time) are included in the SEV calculations, but the rehabilitation is not included as a gain. This means that there is a benefit or a bonus to the stream offset. While the loss is included and accounted for in the overall mitigation for stream loss across the WNP site, the final rehabilitation is not included but is rather an extra, or a bonus. In effect, it results in two instances of gain.

9 Department of Conservation comments on Waihi North project, at paragraph 121.

16. Further, at the time that Tributary 2 will be rehabilitated in its original (or near to) channel, the benefits of gains for the original loss of Tributary 2 will have been realised through stream enhancements within the overall integrated mitigation.

**Coromandel Watchdog of Hauraki Inc.**

17. Dr Joy states that the ability to restore waterways (Warm Spring, the Mataura Stream, the Ruahorehore Stream, the Headwaters Gully stream, the TBI at Northern Rock Stack) is nil but offers no evidence to support this statement.[10]

18. In my experience, the ability to restore and/or re-create waterways to a similar or better condition and function can be fully achieved. At section 22.1.9 of the Freshwater Ecological Effects Report, I have set out the proposal for stream diversion and management in order to optimise the creation of ecologically functional watercourses.[11] I have also set out the principles for the design of the stream diversions in Appendix 4, examples of cross-sections of the indicative diversion channels in Appendix 11, and a Draft Stream Diversion and Development Plan in Appendix 14.[12] These principles and design are typically applied to re-creations of streams, and a well-planned and implemented plan can result in a well-functioning aquatic ecosystem.

19. I note that the TB1 tributary at the Northern Rock Stack is itself a restored diversion with aquatic ecological values and illustrates that diversions can be restored into ecologically functional watercourses.[13]

10 Coromandel Watchdog Comments 'B' comments, at page 180, paragraph 2.

11 B.43. *Freshwater Ecological Assessment* part 1, at section 22.1.9.

12 Noting that Appendix 4 is contained in part 1, and Appendices 11 and 14 are contained in part 2 of B.43. Freshwater ecological assessment.

13 B.43. *Freshwater Ecological Assessment* part 1, at section 18.1.7.

20. In addition, I am familiar with several examples where diversions have been successfully achieved with appropriate design and principles applied (e.g., Duck Creek in Wellington and other watercourses of the Transmission Gully construction, Bennydale Mine site, Gibbs Farm).

21. I emphasise that acceptable outcomes for diversions come with the establishment of good principles, appropriate design, and skilled implementation. In my opinion, the proposed Draft Stream Diversion and Development Plan establish the foundation for this to be achieved.

22. In his comments, Dr Joy also places emphasis on the impacts of selenium.[14] I agree with Dr Joy that New Zealand has generally low levels of Selenium, and indeed at high levels, selenium can be toxic to aquatic organisms.

23. Dr Joy refers to section 13.1.21[15] of the Freshwater Ecological Assessment Report. I clarify that the identified section of the report is not an attempt to justify a selenium level for the Ohinemuri River in freshwater, but to report on the monitoring data and any breaches of the relevant trigger levels for selenium, which is a requirement under the current consent conditions.

24. The important conclusion in that section is that from some 30 years of monitoring of the Ohinemuri River (including fish populations) there is no evidence that the treated water discharge (in meeting the requirements of the resource consent) from the operations is causing adverse effects (including from selenium) on the biological communities of the Ohinemuri River.

**Forest and Bird (F&B)**

25. F&B have commented on the loss of the warm spring located in the Wharekirauponga Stream catchment, and have referenced DOC's report to

14 Coromandel Watchdog Comments 'B' comments, at page 180, paragraph 5.

15 B.43. *Freshwater Ecological Assessment* part 1, at section 13.1.21.

the extent that there are high impacts on freshwater values through the loss of this spring.[16] F&B offer no further evidence or comment on why or how this has a high impact on freshwater values.

26. From section 7.1.17 to section 7.1.24 of the Freshwater Ecological Assessment Report, there is extensive assessment of the ecological values of the warm spring. That discussion concludes that the warm spring has no particular or strongly distinguishing geothermal ecological values and is recorded as having a low ecological value.[17]

27. At section 14.1.5 of the Freshwater Ecological Assessment Report, I conclude that, as a result of the warm spring feature exhibiting low ecological value due to its weak geothermal signature and lack of any unique ecological community, plus the lack of detrimental or modifying effect on the Wharekirauponga Stream, its absence is unlikely to influence downstream ecological values the magnitude of the effect of its loss is very low, and does not constitute a significant environmental impact.

28. This conclusion is further emphasised by DOC as part of their Access Arrangement report published in accordance with section 51(2)(f) of the Act, where DOC stated that 'the impact on freshwater biodiversity is likely to be low due to the composition of the spring and the lack of representative freshwater invertebrate species present'.[18]

29. Accordingly, in the absence of evidence to the contrary, I support my conclusion that the loss of the warm spring does not represent a high impact on freshwater values.

16 Royal Forest & Bird Protection Society of New Zealand Inc comments on the Waihi North Project, at paragraph 118.

17 B.43. *Freshwater Ecological Assessment* part 1, at section 7.1.23.

18 Depart of Conservation, Appendix F: Access arrangement report, at paragraph 100.

30. In relation to the fracture-controlled discharge, F&B state that '[t]he loss of the springs is a significant ecological impact',[19] but no evidence is provided to support this statement.

31. The Boffa Miskell report on the effects potential flow changes on natural state and aquatic ecology[20] provides evidence and concludes that the potential dewatering of the Wharekirauponga Stream will not result in adverse effects on the ecological values of the Wharekirauponga Stream.

32. From paragraph [138] of F&B's comment document, F&B refer to the reclamation of watercourses from the proposed WNP activities. F&B go on to question the omission of the term 'reclamation' across the full extent of changes to watercourses. It is helpful here to reserve the term 'reclamation' for the situations where watercourses are truly a 'manmade formation of permanent dry land by the positioning of material into or onto any part of a waterbody or bed of a river' and with no opportunity to divert the watercourse.

33. In circumstances where a diversion is offered, the watercourse will continue to flow in its own channels before any 'manmade formation of permanent dry land by the positioning of material into or onto any part of a waterbody or bed of a river' occurs. Thus, where a watercourse is diverted, the term reclamation is incorrect as there is a replacement watercourse in place.

34. Accordingly, the 47 m length of the headwater gully at the proposed Gladstone Pit is expected to be reclaimed with no diversion, whereas the remaining watercourses will be diverted prior to their loss and thus would not be considered as reclamations.

35. F&B state that they do 'not agree with the suggestion that the planned diversions and the additional enhancement of existing streams is sufficient

19 Royal Forest & Bird Protection Society of New Zealand Inc comments on the Waihi North Project, at paragraph 121.

20 B.44. *Wharekirauponga Stream Natural State: Effects of potential flow changes on natural state and aquatic ecology*.

to fulfil the requirement to avoid loss of stream extent'.[21] F&B also go on to clarify, based on three points,why they consider that a 'no net loss' of stream extent has not been met.[22]

36. Responding to each point in turn, the Freshwater Ecological Assessment Report is clear that the full extent of loss of watercourse is not met, but there is a shortfall of some 16% of the loss.[23] The report considers that improving the values at an additional 644 m length of watercourse (above the estimate for loss of aquatic ecological values) is sufficient to respond to an overall enhancement of watercourse and thus, in combination with other offsets for ecological values, compensates for the overall impacts on freshwater ecological values and extent of watercourses.

37. In response to paragraph 180(b) of the F&B comment document, that reduction in value resulting from the loss of 4,112 m of watercourses, some of which are assessed to have high value, will not be replaced by diversions, I have responded to similar query at paragraphs 7 – 11 above. F&B offer no evidence of examples of why or how value of watercourse will not be replaced by diversions. In my experience a well-planned and implemented diversion can form a high value ecologically functional watercourse, and I have provided some example locations at paragraph 19 above.

38. In providing confidence for an acceptable outcome for an ecologically functional watercourse, the Freshwater Ecological Effects Report sets out the principles for stream diversion and management in order to optimise the creation of ecologically functional watercourses,[24] along with design principles for stream diversions in Appendix 4, and examples of cross-sections of the indicative diversion channels in Appendix 11, along with a Draft Stream Diversion and Development Plan in Appendix 14.

21 Royal Forest & Bird Protection Society of New Zealand Inc comments on the Waihi North Project, at paragraph 177.

22 Royal Forest & Bird Protection Society of New Zealand Inc comments on the Waihi North Project, at paragraph 180.

23 B.43. Freshwater ecological assessment part 1, at section 22.1.4.

24 B.43. Freshwater ecological assessment part 1, at section 22.1.9.

39. My own involvement in the development and creation of diversions gives me confidence that the stream diversions can provide a high level of aquatic ecological function at the WNP.

40. I note that, as set out in paragraphs 7 – 11, a realistic approach has been taken such that where a diversion is unlikely to achieve ecological values, although it retains connectivity and extent, it has not been included in consideration for an aquatic values offset.

41. At paragraph 180(c), F&B observe that 'in some cases the created diversions are not at or near the locations of stream reclamation and then use the headwater gully at the Gladstone Open Pit as an example. At paragraph 30 above, I have set out my consideration of the difference between a reclamation and a diversion for the purpose of my approach to mitigation at WNP. The loss of the headwater gully at the Gladstone Open Pit is not treated as a diversion and accordingly there is no requirement for a component of diversion being created at the same location.

42. The Freshwater Ecological Assessment Report sets out an integrated approach to the management of effects.[25] As stated, the management of effects for the site is conceived as a wholly integrated 'package' that encompasses all aspects of mitigation and offset proposed for landscape and ecological enhancements. Importantly, it is conceived in a manner so that the 'whole' is vastly improved from just the 'sum of its respective components'.[26] In this approach, I have not matched equivalent ecosystems at specific locations with effects, loss and gain. Rather we have focused on achieving the overall integrated outcome. This prevents a 'patchy' mitigation approach (whereby mitigation effort is dotted at irregular locations) and prefers a concentrated mitigation effort at selected locations.

25 B.43. *Freshwater Ecological Assessment* part 1, at sections 6.1.8 and 23.1.2.

26 B.43. *Freshwater Ecological Assessment* part 1, at sections 23.1.2.

43. Nevertheless, the created diversions are essentially at the same locations as the watercourses they are replacing.

44. I have established at paragraph 32 above that the loss of the intermittent headwater gully at the proposed Gladstone Pit is a reclamation and thus a diversion is not anticipated at this location; rather the effects management is incorporated into the integrated whole of the mitigation.

45. F&B comment on NPS-FM Policy 6 in relation to Gladstone Wetland, noting a reduction in potential groundwater discharge of approximately 30%, and a reduction in Groundwater level of approximately 0.5 m adjacent to the wetland.[27]

46. The effects of these changes on Gladstone Wetland are detailed in the Freshwater Ecological Assessment Report.[28] I have relied on the findings of both GWS (2021) and GHD (2022), and I conclude that as there are unlikely to be any direct or indirect (hydrological) effects on the Gladstone wetland and that no loss of extent or values of the wetland are anticipated. I consider that Policy 6 of the NPS-FM is satisfied.

**Waikato Regional Council (WRC)**

47. In response to the question: '[w]hat might be the impact on the reduction in wetted area at critical times within these streams with no mitigation assumed?', Dr Ngaire Phillips provided in her comments that:[29]

> BML undertook a similar analysis for wetted width, using predicted wetted widths (from GHD). I could not find a specific criterion that BML employed to determine an acceptable level of reduction in wetted area, although I note that an assessment is still made. For example, predicted changes in wetted area at the Thompson Stream site range between 3.04% and 3.10%

27 Royal Forest & Bird Protection Society of New Zealand Inc comments on the Waihi North Project, at paragraphs 160 – 163.

28 Waihi North Project substantive application, B.43. Freshwater ecological assessment part 1, at section 16.1.5.

29 Waikato Regional Council comments on WNP, at page 99.

and are stated to be "within acceptable margins of change to instream habitat." I've assumed BML used the same criterion as for the 7-day MALF i.e. no more than a 5% reduction.

48. WRC has questioned what specific criterion has been used to determine an acceptable level of reduction in wetted area. I confirm that I relied on the NIWA report that determined the 7-day Mean Annual Low Flow (**MALF**) that would be required to keep impacts on suitable instream habitat within -5% for all biota groups.[30] I used this same measure of 5% margin (i.e. no more than a 5% reduction) for assessing change in the wetted width assessment. Where change in wetted width was predicted to be less than 5%, I assessed the effect to be *within acceptable margins of change to instream habitat.* Indeed, such a margin of change in wetted area would be largely undetectable and result in no detectable changes to the aquatic community beyond that occurring in natural circumstances of low flow.

**Tangata whenua**

49. Tangata whenua have described the Ōhinemuri River and its tributaries as vulnerable, with the mana and mauri of the river cited as significantly diminished.[31] They attribute this degradation to historical and ongoing land uses, including mining, urban development, horticulture, and forestry, which have collectively altered the river's ability to sustain life and impacted the environmental, and cultural, landscape of the iwi.

50. Over some 30 years of monitoring there is no evidence of any adverse ecological effects resulting from the treated water discharge on the ecological values of the Ohinemuri River.[32] This conclusion is informed in part from the use of macroinvertebrate communities (as per the metrics MCI and QMCI) which has demonstrated that water and habitat quality remains poor to fair, both before and after the water treatment plant discharge was

30 B.48. *Instream Habitat of the Wharekirauponga Stream and Tributaries*.

31 Comments by Ngāti Porou ki Hauraki and Ngāti Tu Tokanui

32 B.43. *Freshwater Ecological Assessment* part 1, at sections 13.1.24 and 20.1.8.

established. Tangata Whenua have commented that this demonstrates that mitigation measures implemented to date address only the immediate effects of the current operation and do not actively seek to enhance or restore the wider environment.

51. In my opinion, as there are no adverse effects resulting from the treated water discharge on the Ohinemuri River, there is no requirement for a specific mitigation response nor indeed a requirement to enhance the river values. However, the extent of voluntary ecological enhancements carried out by OGNZL (and antecedent companies) is set out.[33] Considerable planting has been undertaken, totalling some 35.31 ha of restoration plantings in and around the Waihi township.

52. It is worth noting that these enhancements have been targeted at other improvements beyond the discharge itself. Much planting has occurred along the margins of the river (and tributaries) for the purpose of reducing erosion and sediment intrusion into the river.

53. I also draw attention to the recommended additional monitoring in the vicinity of the river discharge for temperature and dissolved oxygen .[34] The inclusion of these parameters in monitoring is to assist in understanding what may be preventing improvements in the river ecosystem, and also to inform the Waikato Regional Council freshwater planning process for the management of the Ohinemuri River.

54. Iwi have raised concerns about the potential degradation of wetlands from land clearance, mining activities, and possible contaminant discharges. They emphasise the importance of restoration using indigenous species and specifically request the creation of buffer zones to protect wetlands.

[33] B.43. *Freshwater Ecological Assessment* part 1, at section 4.0.

[34] B.43. *Freshwater Ecological Assessment* part 1, at sections 20.1.13 and 20.1.20.

55. Here I make specific reference to Mataura Wetland which occurs in the Mataura Stream catchment at Willows Farm. The characteristics of Mataura Wetland are described at section 7.1.33 of the Freshwater Ecological Assessment Report. I confirm that fencing and planting of the wetland is proposed, and that a buffer zone of at least 10 m will be created around the wetland.

56. Tangata whenua have expressed concern that proposed tuna and fish salvage plans for stream realignments will not be adequately informed by tikanga and Mātauranga Māori. OGNZL has proposed, as a condition of consent, the development of a Cultural Practices Plan, which will include appropriate protocols for handling indigenous fauna and flora.

**Dated:** 1 September 2025

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Ian Kenneth Grant Boothroyd