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

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**

STATEMENT OF EVIDENCE BY BRIAN LLOYD ON BEHALF OF OCEANA GOLD (NEW ZEALAND) LIMITED

Native frog population estimation and monitoring

Dated 1 September 2025

Counsel acting:
Stephen Christensen
Project Barrister
P 027 448 2325
stephen@projectbarrister.nz

Introduction

1. My full name is Brian Donald Lloyd. My qualifications and experience, and my role in the Waihi North Project (**WNP**), are set out in my statement of evidence dated 5 February 2025 included in Part G of the substantive application document for the WNP.

2. I have been asked by OceanaGold (New Zealand) Limited (**OceanaGold**) 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**) and reports prepared by the Department of Conservation (**DOC**) under section 51 of the Act. In particular, I address:

    a. Coromandel Watchdog of Hauraki Comment: Oceana Gold Waihi North Fast-track Approvals Application;

    b. Hauraki District Council Feedback Waihi North Fast-track Application;

    c. Thames-Coromandel District Council Comment Fast-Track Application CRM:0139842;

    d. DOC's Concessions approvals report;

    e. DOC's Wildlife approvals report; and

    f. DOC's Wildlife access approvals report.

3. 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 to the issues covered in this statement if the Panel requires further assistance from me.

4. I include at the end of this statement a list of all documents I have referred to.

Archey's Frog Population Estimates

5. Several submitters have questioned population estimates of Archey's frogs (*Leiopelma archeyi*) in my report on Archey's frog population estimates (Lloyd, 2025b) [1] claiming that the estimates are over-inflated. None of the comments provide any detailed justification for this claim.

6. It is difficult to reconcile this criticism with the massive disparity between the range of previous estimates of Archey's frog densities (20 – 640 frogs/10 m square plot) described in following paragraphs and the estimates that I used (1.9– 9.4 frogs/10 m square plot).

Comparisons with other population estimates for Archey's frogs

7. There are four studies available that have used capture-recapture methods to obtain plot population estimates for Archey's frogs (Bell et al., 2004; Cisternas et al., 2022; Germano et al., 2023; Hotham et al., 2023). Population densities in three of the studies are considerably higher (20–640 frogs/10 m square plot) than the range population density estimates used in Lloyd (2025b) (1.9–9.4 frogs/10 m square plot).

8. In Bell et al. (2004) plot population estimates were >560 Archey's frogs in a single 10 m square plot in 1991 and circa 60 in 2002 (Figure 2), while in Bell (2010) population estimates for the same plot were >640 in 1991 circa 260 in 2002 and circa 90 in 2007 (Figure 4). In my view, these high estimates of >500 frogs in a 10 m square plot are not credible.

9. In a study of a population of Archey's frogs established by translocation (Cisternas et al., 2022) during the period 2015 to 2020, frog densities ranged between 0.2 to 0.6 frogs/m^2 (Figure 2 in Cisternas et al., 2022). This is equivalent to 20 to 60 frogs in a 10 m square plot.

---

1 B.41 Estimating the Proportion of Coromandel's Archey's Frog Population in the Area Affected by Vibrations from the Proposed Wharekirauponga Underground Mine.

10. Germano et al. (2023) reported on a study using capture-recapture in 4 plots to assess the effect of rodent control on Archey's frog populations at Whareorino. Unfortunately, actual plot population estimates are not provided. The results presented in Figure 3 are difficult to interpret but indicate that adult plot population estimates for 10 m square plots ranged between circa 20 and 90.

11. Hotham et al. (2023) used capture-recapture methods in thirty-two 10 m square plots to investigate the effect of vegetation disturbance on Archey's frog densities. The plot population sizes estimated by capture-recapture analyses ranged from 0 to 25 frogs/plot in the 32 plots with an average estimate of 6.4 for 24 plots in the mine footprint and 2.8 for 12 plots in central Coromandel. There were 150 identified unique individual frogs in the 24 plots giving an average of 6.25 frogs/plot. Figures from Hotham et al. (2023) were used as one of the range of population estimates presented in Lloyd (2025b).

Lack of Robust Sampling Design

12. Paragraph 67 of DOC's Access Arrangement report points to a purported lack of robustness in the preliminary analyses.

13. I acknowledge that survey effort for Archey's frogs was limited and resulted in unsatisfactory population estimates. This was due to processing time delays for Wildlife and Access Agreements to undertake the work, and track closures across the entire Coromandel following Cyclone Hale and Gabrielle during the survey seasons in question.

14. The data used in the report was not ideal as much of it was collected for other purposes. Similarly, implementation of surveys designed to estimate population sizes was severely compromised by extraneous factors. However, the analyses I undertook extracted as much information as possible from the available information. While, the report has already been

peer-reviewed, I would welcome any further review by a suitably qualified and experienced independent biostatistician.

Conservation Status of NZ Native Frogs

15. Several submissions draw attention to the threat classifications of Archey's frog in the NZ Threat Classification System, the IUCN Red List, and the Evolutionarily Distinct and Globally Endangered (**EDGE**) Lists.

NZ Threat Classification System

16. The ranking for Archey's frog in the NZ Threat Classification System was recently revised from 'At Risk, Declining' with an estimated total population 5,000–20,000 mature individuals (Burns et al., 2018) to 'At Risk, Declining' with an estimated total population >100,000 mature individuals (Burns et al., 2024). Several submitters referred to the now outdated 2018 estimate of 5,000–20,000 frogs.

17. While the revised total population estimate appears to be more accurate than the 2018 estimates, it is still not supported by our survey results (Lloyd, 2025b). The most conservative estimate of the total number of adult Archey's frogs in the vibration footprint area is 48,888. The 3.15 km^2 vibration footprint area is 1.01% of the most conservative estimate of the Archey's frog's Coromandel distribution range (312 km^2).

18. While it is difficult to place an exact number on the total Coromandel population, the available information indicates that it is an order of magnitude greater than 100,000.

IUCN RedList

19. The IUCN Red List rankings of Archey's frogs and other Leiopelmid frog species contradict the NZ Threat Classification System Rankings (Table 1). The IUCN listing of Archey's frogs as Critically Endangered is particularly questionable given available information.

Table 1: Comparisons of NZ native fog ranking in the three threat ranking lists mentioned in submissions. The number in brackets is the level of the different threat rankings, with 1 being the highest level of threat.

Species	NZ Threat Ranking	IUCN Red List	EDGE Rank & Score
L. archeyi	(3) At Risk, Declining	(1) Critically Endangered	36 & 23
L. hamiltoni	(1) Nationally Critical	(3) Vulnerable	186 & 13
L. hochstetteri	(2) Nationally Vulnerable & (3) At risk Declining	(5) Least concern	na

20. Archey's frog was last assessed for the IUCN Red List in 2017 when it was ranked as Critically Endangered because of a reported 88% decline in the Coromandel subpopulation (Bell et al., 2004; Bell & Pledger, 2015). This estimated decline was based primarily on results from a single 10 m square plot (Bell et al., 2004; Bell & Pledger, 2015)

21. Bell et al., 2004 concluded that the decline in a single 10 m square capture-recapture plot, first measured during 1994, was evidence of a catastrophic decline in the Coromandel Archey's frog populaton as a result of the arrival of chytrid fungal disease. Declines in encounter rates on a small number of transects elsewhere in Coromandel were cited as supporting evidence for this theory.

22. In my view, extrapolating results from a single 10 m square plot and a few transects to a Coromandel-wide decline over a 520 km^2 range is not warranted.

23. Subsequent studies (Bishop et al., 2009; Eda et al., 2023; Melzer & Bishop, 2010; Moreno et al., 2011; Ohmer et al., 2013) have concluded that the amphibian chytrid pathogen poses low risk to Leiopelmid frogs including Archey's frogs. I refer further to the submissions of Professor Waldman who rejects the theory that declines in Leiopelmid populations can be attributed to chytrid fungus.

24. Results of recent plot surveys and transect searches undertaken for OceanaGold during 2023 and 2024 indicate that high densities of Archey's frogs remain in the area around the capture-recapture plot documented in Bell et al. (2004). Plot surveys and transect searches undertaken for OceanaGold during 2023 and 2024 included replicate searches of two 20 m square plots within 100 and 200 m of the capture-recapture plot and a nocturnal search along a transect on a track passing within metres of the capture recapture-plot. Frog counts from plots and transects close to the capture-recapture plot were among the highest recorded during OceanaGold's surveys. Average frog counts (corrected to per search of a 10 m square plot) from 5 searches of each of the 2 plots were 3.5 (Range: 1-5.25) frogs per a 10 m-square plot and 8.75 (Range: 5.25-15) frogs per 10 m square plot. This compares to an average plot count per search of 1.75 (CI95%: 1.6-1.91) frogs per 10 m square plot from 291 searches of 41 plots spread throughout a wide area of the frog's Coromandel distribution range. A total of 156 frogs were found during one search along the 2.26 km of nocturnal transect giving an encounter rate of 69 frogs/km compared to an average frog encounter rate 4.84 (CI95% 4.5-5.2) along 123 km of transect throughout the frog's Coromandel distribution range.

25. Given the contradicting nature of the IUCN Red List rankings for NZ native frogs and the NZ Threat Ranking, I am surprised that paragraph 198 of DOC's Wildlife approval report provides the IUCN Red List status. For the reasons discussed above, the IUCN Red List rankings are flawed.

Evolutionarily Distinct and Globally Endangered (EDGE) Lists

26. Several submitters claim that Archey's frog have an EDGE list ranking of 1. This is incorrect, the species is ranked as 36 with an EDGE score of 23. (Higher EDGE scores result in lower ranks.)

27. To understand the significance and reliability of EDGE scores and rankings it is important to understand how they are derived. The scores take measures of evolutionary distinctiveness and weight them with the risk of

extinction based on IUCN red listing (Gumbs et al., 2023). The weightings used are: Endangered = 0.485; Vulnerable = 0.2425; Near threatened = 0.12125; and Least Concern = 0.060625.

28. I agree that Leiopelmid frogs are an extremely distinct evolutionary group, but all Leiopelmid species share the same level of distinctiveness. The EDGE rank for *L. archeyi* is 36, whereas the rank for *L. hamiltoni* is 186 and *L. hochstetteri* is not ranked in the EDGE list. These differences are a consequence of the IUCN Red List rankings. As discussed above, the IUCN Red List Rankings contradict rankings the NZ Threat Classification System and are almost certainly flawed. The EDGE list scores and ranks are therefore flawed for the same reasons.

Extinction of the Species

29. Several submitters suggest that the Wharekirauponga Underground Mine (**WUG**) will lead to the extinction of Archey's frogs. I strongly disagree with this notion, which has no scientific support whatsoever. Under the most conservative assumptions, the footprint for the mine includes <1.1% of the species' 312 km^2 Coromandel distribution range (Lloyd, 2025b). Given the relatively low quality of frog habitat in the mine footprint, the proportion of the Coromandel population resident in the mine footprint is likely to be much lower. I can conceive of no impact from the mine that could lead to the species extinction on Coromandel Peninsula.

Native Frog Monitoring Plan

30. It should be noted that the Native Frog Monitoring Plan is provided as a draft and must be certified following the commencement of the WNP.

31. In response to paragraphs 167 and 173 of DOC's Wildlife approval report, I welcome peer review of the monitoring plan by a suitably qualified and experienced independent statistician and experienced herpetologists to provide constructive dialogue to improve the plan and ensure the monitoring

programme uses rigorous methods and provides statistically robust information about the two frog species.

32. Paragraph 167 of DOC's Wildlife approval report purports to have identified critical gaps in the Native Frog Monitoring Plan (Lloyd, 2025c), including a lack of clarity around statistical assumptions, missing population parameters, and the absence of power analyses or simulations to validate the proposed design as well as a need for pilot studies, and peer review.

Statistical Power, Assumptions and Missing Population Parameters

33. Power analyses and simulations were undertaken for monitoring Archey's frogs and Hochstetter's frogs, with details of the simulations included in Appendices D, E, F & G of an earlier version of the monitoring plan (Lloyd, 2024).[2] The results of the simulations are mentioned in the final version of the plan. However, details of the simulations were not included in the current draft version to reduce the size of the plan. I am happy to provide DOC with the earlier version of the plan with details of the simulations.

34. Further, although undertaking power analyses and simulations when designing survey and monitoring programmes is best practice, previous capture-recapture studies on Archey's frogs, including those conducted by DOC or universities, have not included such analyses. Surveys of Hochstetter's frogs are also routinely undertaken and reported on without power analyses.

35. I do not consider there to be any lack of clarity around statistic assumptions in the draft monitoring plan. The statistical assumptions underlying the methods and the demographic parameter estimates that can be derived are all documented in the references provided to describe the statistical methods that will be used (spatially explicit capture-recapture, closed and robust capture-recapture and N-mixture modelling). Appendix A of Lloyd

2 A power analysis is a statistical calculation performed before a study begins to determine the minimum sample size needed to detect a real effect with a high degree of confidence, if one exists.

(2025a) also specifies that the capture recapture method can provide a range of demographic estimates for plot populations including abundance, survival, fecundity and recruitment.

36. The work reported in Lloyd (2025a, & 2025b) includes initial pilot studies that provide important parameter estimates (e.g. detection probabilities, likely population densities) used in simulations and in the study design. Actual pilot studies of the proposed work require Wildlife authorities and DOC concessions. It is proposed these are undertaken in the first years of the WNP.

Replication

37. Paragraph 168 of DOC’s Wildlife approval report expresses concern about the proposed monitoring design, particularly the limited replication and the decision not to model temporary emigration, which could lead to biased population estimates. I assume that the concern is about limited geographical replication in the capture-recapture monitoring, not replication of searches. Several capture-recapture plots in each of the three treatment areas would be ideal. However, the results of simulations show that a single large plot provides much more reliable results than many small plots with the same total area (Lloyd, 2024).

38. The resources required for capture-recapture surveys means that a realistic decision must be made to balance the need for geographic replication and plots large enough to achieve robust estimates. I have proposed a minimum plot size of 30 m square with the possibility of increasing to 40 m square depending on initial results. Simulations show that a 30 m or 40 m square plot will produce much more reliable results than 9 or 16 of the standard 10 m square plots. I also note that most capture-recapture studies of Archey’s frogs have only had one or two 10 m square plots in each treatment area.

Surveying on consecutive nights to model temporary emigration

39. I strongly disagree with DOC's approach of monitoring capture-recapture plots on consecutive nights to model temporary emigration. I explain my objections to this method on page 16 in Appendix A of Lloyd (2025c). Surveying on consecutive nights is common practice for DOC staff. However, in my opinion, the approach is primarily for the convenience of field staff and compromises results.

40. Contrary to DOC's assertion, the approach I have proposed does not bias estimates and does allow estimates of emigration. The temporary emigration model proposed by DOC requires data from three successive survey sessions to obtain demographic estimates. With annual survey sessions, the first full set off estimates will only be available 3 years after the work begins and successive annual estimates will be one year out of date. Given the need for timely information for adaptive management for the WUG project, I do not consider the temporary emigration model approach to be as useful.

Hochstetter's frog transects

41. Paragraph 169 of DOC's Wildlife approval report describes concerns over the sampling design for Hochstetter's frogs. Shifting from the standard 20 m transects to the recommended 50 m transects is sensible but I will need to rerun simulations to determine the number of transects required.

42. DOC's criticism of using two observers starting 10 m apart on a 20 m transect appears to misunderstand the proposed method. The two observers will survey separate 10 m sections of the transect. In my view, this approach would not increase observer bias, which is inevitably a significant factor in daytime surveys for Hochstetter's frogs.

43. I can see no good reason for repeated surveys of a transect on the same day. In my view, this is not a sensible sampling strategy, especially when analyses will be undertaken using N-mixture modelling.[3]

44. I disagree with the suggestion in DOCs Wildlife approval report that nocturnal surveys of Hochstetter's frogs should be discouraged due to trampling risks. I am aware of Similar arguments have been made in the past to oppose nocturnal surveys for Powelliphanta snails. However, the results of radiotracking studies on two species of Powelliphanta snails (Lloyd, 2015; Lloyd, 2017) and extensive experience using nocturnal surveys indicate that greater foot traffic during daytime searches of snail refugia present a much greater risk to snails than nocturnal surveys.

45. My experience with surveying for Powelliphanta shows nocturnal searching is much more cost-effective than daytime searching, with average capture rates for the two methods of 0.75 person-hours per snail during nocturnal searches and 9.1 person-hours per snail during daytime searches.

46. Powelliphanta snails' and Hamilton frogs' behaviour with above ground activity at night and daytime retreat to sub-surface refugia are very similar. As a result, I would expect similar results for Hamilton's frogs. Importantly, increased capture-rates per person during nocturnal searches means that for the same effort much better statistical power can be achieved with nocturnal surveys than daytime surveys. Thus, increasing capture rates decreases the amount of search effort required and reduces the probability of trampling snails during searches.

47. I proposed that trials of nocturnal surveys for Hochstetter's frogs should be undertaken as I believe the current daytime surveys are extremely disruptive to the frogs because their daytime refugia are disturbed repeatedly. Also, daytime surveys are very inefficient with low frog detection rates and removing observer bias from data collected during daytime

[3] An N-mixture model is a statistical tool used in ecology to estimate population abundance and detection probability from repeated count data, especially when individual animals cannot be identified.

surveys is challenging. I continue to support nocturnal surveys for these reasons, in addition to those discussed above.

DNA Identification method

48. Paragraph 171 of DOC's Wildlife approval report expresses concern over the use of both photo ID and using DNA samples from buccal swabbing. The intention is to trial buccal swabbing and if it proves an effective technique only use buccal swabbing. There are several reasons for replacing the photo ID method with DNA identification from buccal swabs. The main reason is that it will not entail the lengthy and intrusive handling required by the conventional photo ID method. Additionally, DNA identification is more reliable than photo ID and provides extra information about the population's demographic history and kinship patterns.

Climatic Conditions

49. Hauraki District Council, Thames-Coromandel District Council and DOC's reports all specify in the proposed Consent Conditions that night-time surveys for frogs (presumably just Archey's) should be undertaken during climatic conditions that maximise the chance of native frog emergence specifying *warm – at least 12 degrees C, after rain – i.e. ground and understory vegetation must be wet or moist, and little or no wind.*

50. It is unclear where this recommendation comes from, but probably Cree (1989), who concluded something rather different: Archey's frog *emergence is strongly and positively correlated ($P < 0.005$) with the following moisture-related factors: relative humidity, rainfall, and wetness of vegetation, and negatively ($P < 0.001$) with vapor pressure deficit. Air temperature showed a weaker and barely significant ($P < 0.05$) correlation with emergence, and strength of wind gusts no significant correlation ($P > 0.1$).*

51. The conditions specified by HDC, TCDC and DOC are unnecessarily restrictive and will make it difficult or nearly impossible to achieve required

survey effort. In the native frog monitoring plan (Lloyd, 2025c), I stated that *to achieve high capture probabilities, searches will only be undertaken on nights when weather conditions favour frog above-ground activity, with minimum overnight temperatures > 10°C and minimum overnight relative humidity > 90%.* This recommendation is based on the results of nocturnal searches along 40 transects with a total length off 123 km and 291 replicate nocturnal plot searches of 41 plots.

52. In Lloyd (2025b), I analysed the effects of climatic conditions on Archey's frog encounter rates during nocturnal searches along transects - Table 9 & Figure 11, Page 23 Lloyd (2025b). The key climatic conditions affecting frog encounter rates are Relative Humidity (**RH**) >90% and ambient temperature <17ºC. Information from the transects also indicate that Archies frogs are active at temperatures less than 12ºC, however there were few transect undertaken at lower temperatures. In an analysis of frog encounters during plot searches, only RH had a significant effect.

53. The effects of ambient conditions on frog detection rates is an important consideration in frog survey design. The frog surveys undertaken to-date were not designed to investigate the effects of ambient conditions on frog detection rates, consequently I proposed an investigation into how ambient conditions during searches affect frog detection rates, Page 35 in Lloyd (2025b).

Dated: 1 September 2025

Brian Donald Lloyd

REFERENCES

Bell, B. D. (2010). The threatened Leiopelmatid frogs of New Zealand: Natural history integrates with conservation. *Herpetological Conservation and Biology 5*(3), 515-528.

Bell, B. D., Carver, S., Mitchell, N. J., & Pledger, S. (2004). The recent decline of a New Zealand endemic: How and why did populations of Archey's frog Leiopelma archeyi crash over 1996–2001? *Biological Conservation 120*, 189-199.

Bell, B. D., & Pledger, S. (2015). Archey's frog, Leiopelma archeyi in the Coromandel Ranges - how has it fared sinces its population crash over 1996-2001? Doesn't exist. In N. Nelson & S. Keall (Eds.), *Abstracts of papers presented at the 15th and 16th biennial conference of the Society for Research on Amphibians and Reptiles in New Zealand.* (pp. 11). Wellington, New Zealand, : Department of Conservation.

Bishop, P. J., Speare, R., Poulter, R., Butler, M., Speare, B. J., Hyatt, A., . . . Haigh, A. (2009). Elimination of the amphibian chytrid fungus Batrachochytrium dendrobatidis by Archey's frog Leiopelma archeyi. *Diseases of Aquatic Organisms, 84*, 9-15.

Burns, R. J., Armstrong, D. P., Bell, B. D., Haigh, A., Germano, J., Rawlence, N. J., . . . Michel, P. (2024). *Conservation status of amphibians in Aotearoa New Zealand, 2024.* Retrieved from Welliongton NZ.

Burns, R. J., Bell, B. D., Haigh, A., Bishop, P., Easton, L., Wren, S., . . . T., M. (2018). *Conservation status of New Zealand amphibians, 2017*. Retrieved from Department of Conservation, Wellington, NZ.

Cisternas, J., Easton, L. J., Germano, J. M., & Bishop, P. J. (2022). Demographic estimates to assess the translocation of a threatened New Zealand amphibian. *Wildlife Research*.

Cree, A. (1989). Relationship between environmental conditions and nocturnal activity of the terrestrial frog, Leiopelma archeyi. *Journal of Herpetology, 23*, 61-68.

Eda, A. R. A., Bishop, P. J., Altobelli, J. T., Godfrey, S. S., & Stanton, J. L. (2023). Screening for Batrachochytrium dendrobatidis in New Zealand native frogs: 20 years on. *New Zealand Journal of Ecology, 47*(2).

Germano, J. M., Bridgman, L., Thygesen, H., & Haigh, A. (2023). Age dependant effects of rat control on Archey's frog (Leiopelma archeyi) at Whareorino, New Zealand. *New Zealand Journal of Ecology, 47*(2).

Gumbs, R., Gray, C. L., Böhm, M., Burfield, I. J., Couchman, O. R., Faith, D. P., . . . Rosindell, J. (2023). The EDGE2 protocol: Advancing the prioritisation of Evolutionarily Distinct and Globally Endangered species for practical conservation action. *PLOS Biology, 21*(2), e3001991.

Hotham, E. R., Muchna, K., & Armstrong, D. P. (2023). Abundance of Leiopelma archeyi on the Coromandel Peninsula in relation to habitat characteristics and land-use. *New Zealand Journal of Ecology, 47*(2).

Lloyd, B. D. (2015). *Escarpment Mine Project Powelliphanta patrickensis Management to May 2015*. Retrieved from Buller Coal Ltd.

Lloyd, B. D. (2017). *A Radio-tracking Study of Powelliphanta hochstetteri*. Retrieved from Project Janzoon, Motueka.

Lloyd, B. D. (2022a). *Combining Nocturnal Transects and Replicate Plot Counts to Obtain Population Estimates for Archey's Frogs In Coromandel*. Retrieved from OceanaGold Waihi Operation.

Lloyd, B. D. (2022b). *Nocturnal Transects for Archey's frogs in the Coromandel*. Retrieved from OceanaGold Waihi Operation.

Lloyd, B. D. (2022c). *Proposal for Work to Obtain Population Estimates for Archey's Frogs in the Coromandel Peninsula*. Retrieved from OceanaGold Waihi Operation.

Lloyd, B. D. (2024). *A Plan to Monitor the Response of Populations of Two Native Frog Species to The Proposed Wharekirauponga Underground Mine Project*. Retrieved from OceanaGold, Waihi.

Lloyd, B. D. (2025a). *Analyses of the Results of Surveys for Hochstetter's Frogs Undertaken in 2024 to Assess the Impacts of Stream Flow Reductions Associated with the Wharekirauponga Underground Mine*. Retrieved from OceanaGold, Waihi NZ. (**Part B, Technical Report 42**)

Lloyd, B. D. (2025b). *Estimating the Proportion of the Coromandel's Archey's Frog Population in the Area Affected by Vibrations from the Proposed Wharekirauponga Underground Mine*. Retrieved from OceanaGold, Waihi NZ. (**Part B, Technical Report 41**)

Lloyd, B. D. (2025c). *A Plan for Monitoring Potential Effects of the Proposed Wharekirauponga Underground Mine Project on Native Frogs*. Retrieved from OceanaGold, Waihi. (**Part B, Techincal Report 58**)

Melzer, S., & Bishop, P. J. (2010). Skin peptide defences of New Zealand frogs against chytridiomycosis. *Animal Conservation, 13* (Suppl. 1 Special Issue: Excerpts from the 6th World Conference of Herpetology), 44-52.

Moreno, V., Aguayo, C. A., & Brunton, D. H. (2011). A survey for the amphibian chytrid fungus Batrachochytrium dendrobatidis in New Zealand's endemic Hochstetter's frog (Leiopelma hochstetteri). *New Zealand Journal of Zoology, 38*(2), 181-184.

Ohmer, M. E., Herbert, S. M., Speare, R., & Bishop, P. J. (2013). Experimental exposure indicates the amphibian chytrid pathogen poses low risk to New Zealand's threatened endemic frogs. *Animal Conservation, 16*(4), 422-429.

Townsend, A. J., de Lange, P. J., Duffy, C. A. J., Miskelly, C. M., Molloy, J., & Norton, D. A. (2008). *New Zealand threat classification system manual*. Retrieved from Department of Conservation, Wellington, New Zealand