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 RICHARD LESLIE CHILTON ON BEHALF OF OCEANA GOLD (NEW ZEALAND) LIMITED

Air quality effects regarding Archey's Frog

Dated 1 September 2025

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Introduction

1. My full name is Richard Leslie Chilton.

2. My qualifications and experience, and my role in the Waihi North Project (**WNP**), are set out in my statement of evidence dated 28 February 2025 included in Part G of the substantive application document for the WNP.

Scope of evidence

3. I have been asked by OceanaGold (New Zealand) Limited 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 Act. In particular:

   a. Hauraki District Council Feedback – Waihi North Fast-track Application. (HDC, 25 August 2025). Specifically:

      i. Nitrogen dioxide emissions associated with blasting as raised in the specialist memorandum on blasting and vibration prepared by Mr Cameron McKenzie of Blastechnology.

   b. Feedback from the Coromandel Watchdog of Hauraki (**CW**), contained in Appendix B.01 (paragraphs 16 – 18) and relating to air impacts associated with Archey's frog, in particular:

      i. Toxicity of PM_{10} particles and comparison to habitat around a dusty road.

      ii. Absence of research of particles impacting frogs.

      iii. High level of uncertainty around effects.

4. 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.

Nitrogen dioxide emissions associated with blasting

5. Mr McKenzie, in his review, describes his concern regarding the impact of "blasting fume (generally referred to as NO_X)" (page 105 of the HDC feedback). He further states on page 112:

> That the Waihi community, if exposed to thick orange fume emanating from the GOP or borrow pits, will almost certainly be alarmed and concerned about health and respiratory impacts.

6. Mr McKenzie recommends that Condition 45g require that the Vibration Monitoring Plan be expanded to detail the methodology to be deployed to monitor fume appearance.

7. Tonkin & Taylor (**T+T**) assessed the air quality effects of NO_X emissions from the 'unplanned detonation air quality assessment' associated with the Wharekirauponga Underground Mine. This assessment (herein referred to as the **T+T assessment**) is included as Appendix H of the Technical Assessment of Hazardous Substances[1] that was submitted with the fast-track application.

8. The T+T assessment examined the potential air quality effects of an unplanned detonation of an underground Class 1 explosives storage facility. I consider this scenario would give rise to NO_X emissions that are of a significantly larger scale than those that would occur as a result of routine and controlled blasting operations. For this reason, examining the results of the assessment provides a reasonable – albeit highly conservative – basis

[1] B.19 *Technical Assessment of Hazardous Substances Willows Road site and the Wharekirauponga Underground Mine* – Waihi North Project.

to infer the potential effects of NO_X emission associated with routine blasting.

9. NO_X emissions are comprised of nitrogen monoxide and nitrogen dioxide (NO_2), the latter constituent which is of concern in terms of human health effects and for which there are New Zealand national ambient air quality standards and guidelines for the protection of human health.

10. The T+T assessment quantified the NO_X emissions associated with an unplanned detonation of the explosives store and used standard dispersion modelling methods to predict ambient air concentration at the surface from points of discharge (mine vents and portals). The results were then added to background concentrations and assessed against the appropriate human health assessment criteria.

11. The main conclusions of the T+T assessment in relation to NO_2 is as follows:

> Predicted cumulative concentrations of NO_2 in the vicinity of the vent raises will be, at a maximum, half the assessment criteria for the protection of human health. The locations that these peaks are predicted at are in DOC reserve forest, relatively remote from any public walking tracks. The likelihood of a detonation in the underground store occurring, simultaneous with worst-case meteorological conditions and a member of the public being present at the most impacted locations is very low.

12. Given this context, I consider it unlikely that NO_X emissions associated with controlled, routine blasting activity would give rise to NO_2 concentrations approaching human health assessment criteria at off-site locations. Consequently, I do not agree with Mr McKenzie's recommendation for further monitoring of blasting fume.

Toxicity of PM_{10} particles and comparison to habitat around a dusty road

13. Paragraph 16 of Appendix B.01 of the feedback from CW, states that *"Describing the PM_{10} levels only refers to size but not particulate make-up (or toxicity). Comparing the forest to an unpaved dusty road is not an appropriate comparison."*

14. I consider that substantial body of epidemiological evidence that supports the air quality standards and guidelines for PM_{10} are based on the relationship between exposure to the total mass of particles and specified health outcomes. These epidemiological studies have considered population exposure to PM_{10} in a range of environments, including urban environment that will include relatively high contributions from combustion-derived particles, which are likely to be the most significant in terms of individual toxicity.

15. Differences in particle toxicity could arise from multiple attributes (composition, surface area, oxidative potential, shape, bioavailability). However, there is no 'universally accepted', validated, and standardised assay or index that maps particle exposure to health risk with the same consistency as mass.

16. While some components of particulate matter (e.g., certain metals, elemental carbon) may have differing toxicity per unit mass, the epidemiologic evidence is not yet strong or consistent enough to support the development of "toxicity equivalency factors" for different constituents of particulate matter. For this reason, ambient air quality standards and guidelines are based on total PM_{10} and do not distinguish the toxicity of different particles that make up PM_{10}.

17. Given this context I consider that it is appropriate for an assessment to be based on the concentration of PM_{10} particles, rather than the makeup or toxicity of particles.

18. With regard to comparing the forest to an unpaved dusty road, I provide further comment on this matter in Paragraph 19 below.

Absence of research of particles impacting frogs

19. Paragraph 17 of Appendix B.01 of the feedback from CW, states that *"Frogs in the forest have practically no exposure to dust in their natural state and there is no data or research on what particulates containing chemicals from mine dust might do to their sensitive bodies."*

20. The assessment I prepared draws comparisons with an Archey's frog habitat close to a public unpaved road, where PM_{10} and dust concentrations will be significantly higher than anticipated from the mine vent. The dust from the mine vent is expected to be relatively inert in its natural form, and not dissimilar to dust from the rock used to form unpaved road surfaces.

High level of uncertainty around effects

21. Paragraph 18 of Appendix B.01 of the feedback from CW, states that *"There is a high level of uncertainty around these effects not addressed in the Application."*

22. I do not agree that there is a high level of uncertainty about effects of dust from the project on Archey's frogs.

23. The discharge from the vent has been characterised using a conservative approach, including making the conservative assumption that the discharge of particulate matter would be at a level that is appropriate for inhalation by mine workers (i.e., the work place exposure standard). In practice, the mine

will need to be operated within workplace exposure standards and monitoring from existing operations confirm this is readily achievable.

24. Given the low concentrations associated with the discharge, it is very unlikely that there will be high levels of PM_{10} in the receiving environment surrounding the mine vent. This has been confirmed using standard dispersion modelling methods that are used extensively throughout New Zealand and internationally. I consider the modelling to be conservative, particularly as it assumes a constant maximum rate of discharge.

25. The resulting cumulative concentrations are predicted to be well within human health guideline values for the general public. As noted above, human health standards and guidelines are for the protection of the general public, including the very old, young and those with compromised health.

26. Air quality criteria do not exist for frogs or other species. Therefore, I made a further comparison using:

    a. ecological studies of an Archey's Frog population near an unpaved road; and

    b. roadside monitoring of dust and PM_{10} near an unpaved road.

27. These studies show that there is a healthy frog population in a location where dust and PM_{10} concentrations will be much higher than those associated with the mine vent.

28. When taking into account the above factors, I conclude that there is an appropriate and reasonable level of scientific certainty regarding the

predicted impacts of the mine vent, and that the assessment approach is a conservative one.

Dated: 1 September 2025

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Richard Leslie Chilton