

**Before the Independent Hearing Panel**

**In the Matter** of the Resource Management Act 1991 (**RMA**)

**And**

**In the Matter** of an application to the Central Otago District Council and Otago Regional Council for resource consent to establish and operate a gold mining activity at 1346 – 1536 Teviot Road, Millers Flat

**Reference** RC230325 (Central Otago District Council)  
RM23.819 (Otago Regional Council)

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**Evidence of Neil Williman on behalf Hawkeswood Mining Limited**

**(Flood Hazard)**

**Dated 29 April 2024**

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## Introduction

1. My full name is Neil David Williman. I am a Senior Water Resources Engineer at GeoSolve Limited. I hold a Bachelor of Natural Resource Engineering (with Honours) from the University of Canterbury and am a registered Chartered Professional Engineer with Engineering New Zealand, as well as a Chartered Water and Environmental Manager through the Chartered Institute of Water and Environmental Management (UK).
2. I have 12 years' experience as a water resources engineer, with a focus on flood management and natural hazard mitigation, as well as drainage and environmental projects. I have been based in GeoSolve's Queenstown office since early 2022 and have worked on flood hazard assessment and mitigation projects all over Otago during that time.
3. I was instructed by Hawkeswood Resources in July 2023 to prepare a flood hazard assessment for the proposed gold mining activity. I am familiar with the area to which the application for resource consent relates. I inspected the site and surrounds with the applicant in September 2023, and have spent significant time in the Clutha River valley, having lived in Otago for several years prior to working for GeoSolve in Queenstown. I wrote the original 'Assessment of Effects' lodged with the consent application, and a summary of what I assessed and concluded is provided under 'Scope of Evidence' below. That assessment has been through minor revisions due to minor alterations to the proposed activity details, however the main findings and conclusions have remained consistent throughout.
4. Although this is not a hearing before the Environment Court, I record that I have read and agree to abide by the Environment Court's Code of Conduct for Expert Witnesses as specified in the Environment Court's Practice Note 2023. This evidence is within my area of expertise, except where I state that I rely upon the evidence of other expert witnesses as presented to this hearing. I have not omitted to consider any material facts known to me that might alter or detract from the opinions expressed.

## **Scope of Evidence**

5. My evidence will address the following:
  - a. Likelihood of the proposed mining activity site being affected by a flood event.
  - b. Whether the proposed mining activity would exacerbate flood hazard to other properties.
  - c. The anticipated effects of a flood event affecting the proposed mining activity site.
  - d. A response to Aukaha's submission on behalf of Kā Rūnaka, stating 'Further clarity is sought in regard to extreme flood events'.
  - e. Comments on the s42A report.

## **Likelihood of the proposed mining activity site being affected by a flood event**

6. As concluded by our previous reporting, a small area within the mine site in the vicinity of the Tima Burn (~2% of the site) has the potential to be reached by flood water in a ~100-year ARI storm event or greater. GeoSolve understands from the applicant that this area will be backfilled as soon as the mining operations in that particular location are complete (stated by the applicant to take ~6 months). Therefore, the probability of flood waters impacting the active site has been calculated to be 0.5% for the relevant period of operation.

## **The potential for the activity to exacerbate flood hazard to other properties**

7. As concluded by our previous reporting, the proposed activity is not anticipated to adversely affect or exacerbate off-site flood hazard. If the mine pit were to be entered by flood water this would store a part of the flood volume, thus attenuating the flow and reducing the risk to other properties.

## **The anticipated effects of a flood event affecting the proposed mining activity site**

8. In the unlikely event that the mining operation is affected by flooding from the Clutha River and/or Tima Burn any effects are to be managed, mitigated and remediated by the Applicant. Effects of floodwater reaching the excavation may include scour/slumping of the batter slopes and/or temporary inundation of the operational mining area. Due to the relatively long warning time that would be provided for a flood event of a magnitude that could reach the excavated area, in my opinion any batter slopes near the Tima Burn could be pre-emptively buttressed/stabilised if required and equipment moved to higher ground. Given the anticipated warning time, the risk to staff is considered to be very low.

## **In response to Aukaha's submission on behalf of Kā Rūnaka, stating 'Further clarity is sought in regard to extreme flood events'.**

9. The six largest flood events of the Mata-Au/Clutha River on record have been analysed as a part of this assessment. It has been determined that the two largest flood events, being those of 1878 (approx. return period 400-500 years) and 1999 (approx. return period 100 years), would have reached the location of (part of) the proposed mining activities. This would have occurred from the Mata-Au/Clutha River causing the Tima Burn to 'back up', and spill into the excavation in the vicinity of the Tima Burn, as referred to

above in paragraph 6 (in the hypothetical situation that the mine pit existed in that location then). The probability of an event of such magnitude occurring in the approximately 6 month period that the area was operational is very low, approximately 0.5%. It is noted again that if a pit in this location were to be affected by flooding this would attenuate flood waters, not exacerbate them, and would therefore slightly reduce flood risk to other properties.

## **Comments on the s42A reports**

### **10. The Otago Regional Council Section 42A Staff Recommending Report**

The section (titled *Hazards and Risks*) of the ORC s42A report is relevant to GeoSolve's Flood Hazard Assessment. It states:

*As previously noted, the Applicant has submitted a flood hazard assessment with the CODC application, prepared by GeoSolve. This report notes that the mine pit area will be located within the flood risk area, albeit to a limited degree, and that flooding would only reach the mine area during extreme flood events. GeoSolve considers that, given the relatively short duration of the mining activity, such extreme flood events are unlikely to occur during the mining activity. Nevertheless, the report recommends that any works in the vicinity of the Tima Burn are immediately backfilled upon completion of mining, to mitigate flood risk. Overall, given the conclusions of this report, I consider that the levels of risk to people, communities and property from natural hazards can be appropriately managed and mitigated, and will not exceed a tolerable level. The proposal is therefore consistent with these provisions.*

11. My understanding of the above response from ORC is that the information provided as a part of our previous reporting is considered sufficient by the ORC, and that no further information is requested at this time. There is agreement that flood risk is acceptable.

### **12. The Central Otago District Council Report of Planning Staff**

The section (titled *Natural Hazards*) of the CODC Planning Staff Report, based on the CODC District Plan, is relevant to GeoSolve's Flood Hazard Assessment. It states:

*[132] The Geosolve Report states that approximately 2% of the mine site, near the Tima Burn, could be susceptible to flooding, but only during a 100-year ARI storm event or greater. The report indicates that the area near the Tima Burn that is susceptible to flooding will be backfilled once mining operations in that area are complete, which is expected to take approximately 6 months.*

*[133] In the event that the mining operation is affected by flooding from the Clutha River / Mata-au and/or Tima Burn the Geosolve Report states that this will be managed internally by the applicant.*

*[134] The submission of Kā Rūnaka requests further clarity over the conclusions of the flood hazard assessment report, particularly in relation to extreme flood events. I agree with this submission, that further assessment would provide certainty around the effects on the Tima Burn, should a 100-year ARI storm event or greater occur.*

*[135] Ultimately, I consider that when relying on the Geosolve report, the risk of flood hazard effects is minimal, however, if the panel is of mind to grant consent, I recommend further assessment be provided by the applicant, in relation to the management of flooding onsite, and the adequacy of the proposed measures.*

13. In my opinion Kā Rūnaka and CODC's request for further clarity regarding the conclusions of the flood hazard assessment report is answered by the information provided in paragraph 9. above. I understand from CODC's response that they are not requesting further information at this time, but that further assessment in relation to the management of onsite flooding may be requested upon the granting of consent. In summary:

- a. From a hydraulic/flooding perspective, the effects on the Tima Burn during a flood event with the excavation present would mimic the effects on the Tima Burn during a flood event without the excavation present, up to an approximately 1% AEP flood event. Beyond that size of flood event some floodwater may spill into the proposed excavation, and as a precautionary measure it is recommended that the batter slopes of the excavation are to be buttressed for stability against scour or slumping if a 100 year rainfall event is forecast. I recommend this measure is incorporated into the site's operational and management plan.

- b. GeoSolve are available to provide further information in relation to the management of flooding onsite, and the adequacy of the proposed measures if/when requested at detailed design stage and during preparation of relevant management plans. I consider that this aspect of the operations can be managed in a suitable manner using industry standard methodologies. Examples of these include; an Emergency Management Plan to protect staff & key equipment and prevent release of hazardous/toxic materials; and pumping/draining out of floodwaters to restore mine operation.

14. It is noted that the s42A report includes a condition as detailed below:

*17. Works within the 2% of the mine site, near the Tima Burn, which could be susceptible to flooding, as identified in the report prepared by GeoSolve, titled 'Millers Flat Alluvial Goldmine, 1346-1536 Teviot Road, Millers Flat, Roxburgh' (GeoSolve Report), shall be completed and then area backfilled within 6 months.*

15. I would like to clarify that this 6 month period is the amount of time that this part of the excavation was understood to be open for. I have performed a statistical calculation on the likelihood of a 100 year flood occurring within that time frame. My assessment is not stating that 6 months is the maximum suitable time frame for that part of the excavation to be open. The key point is that if that part of the excavation were to be open for longer than 6 months, then it would still not present risk of adverse effects off-site as explained in paragraph 9. As stated in paragraph 13.a. above, in my opinion if a 100 year rainfall event was observed in the weather forecast then the part of the excavation closest to the Tima Burn could be buttressed in order to mitigate the potential effects of an on-site flooding event.

## **Conclusion**

16. If an extreme flood event were to occur during the relatively brief period of time that the proposed excavation area near the Tima Burn was open, this would not exacerbate flood risk off-site. The on-site effects, such as potential batter scour/slump, could be managed by buttressing the batters in response to an extreme rainfall event being forecast. The warning time

between an extreme rainfall event being forecast and actual river level rise is considered sufficient for personal and equipment to move/be moved to higher ground. This can be managed by an effective site operations plan.

*Neil Williman*

**Neil Williman**

Dated 29 April 2024