



MEMORANDUM

24053E

Matakanui Gold Limited
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11 September 2026

BENDIGO-OPHIR GOLD PROJECT
RESPONSE TO SUPPLEMENTARY EVIDENCE
From: Professor Steven Emerman & Dr Alexander McAlpine

1. Purpose

The supplementary statements of Professor Steven Emerman and Dr Alexander McAlpine have been reviewed insofar as they relate to the geotechnical assessment of the proposed Rise & Shine (RAS) open pit and underground mine.

A number of the matters raised are valid geotechnical considerations and, indeed, are substantially consistent with limitations, uncertainties and recommendations already identified in Document B.28 Peter O'Bryan & Associates Geotechnical Assessment Open Pit and Underground Mining - Rise and Shine Deposit. However, there is an important difference between identifying credible adverse possibilities which require investigation and management, and assuming that those possibilities represent the conditions which will actually prevail. There is also an implicit but incorrect assumption that such conditions could not be managed to provide safe operating and enable development appropriately stable post-closure conditions.

Aspects of both statements tend towards the latter approach. Potential variation or uncertainty is repeatedly interpreted in the direction of an adverse or worst credible condition without equivalent consideration of the probability of that condition occurring, the spatial extent over which it might occur, or the opportunity to identify and respond to actual conditions progressively during mine development.

2. Context & purpose of Document B.28

It is important that B.28 is considered in the context in which it was prepared.

The report did not purport to constitute a final feasibility-level geotechnical design. It self-describes as presenting preliminary findings from a review of proposed open pit and underground mining and considered investigations and assessments previously undertaken by others.

No new subsurface investigation was undertaken specifically for the assessment. The work relied heavily upon the earlier PSM Consult Pre-Feasibility Study (PFS) investigation, which B.28 considered to have been undertaken in accordance with current industry practice and whose reported results were accepted as reliable.

This did not mean that the assessment was undertaken without direct appreciation of site conditions. The work included a site visit from 09 to 13 January 2025, inspection of the RAS and surrounding areas, inspection and review of core from geotechnical boreholes MDD286, MDD287, MDD289 and MDD290, and review of core photographs and geological logs from a further 28 resource-definition boreholes.

Document B.28 therefore represents a critical reassessment and interpretation of the geotechnical information then available, supplemented by direct site and core observations. It should not be interpreted as representing a claim that all investigations necessary for final mine design had already been completed.

Indeed, the B.28 explicitly states that the reassessment was based on existing data, that further geotechnical data were required, and that the additional data would subsequently be used for feasibility-level assessment.

3. Agreement regarding the need for further work

The fundamental issues raised in the supplementary evidence are also noted in B.28, consequently there is considerably more agreement between B.28 and the supplementary evidence than might initially appear.

Dr McAlpine observes that the Project has not progressed beyond the pre-feasibility stage and lists further requirements concerning stress, rock-mass properties, structural conditions, hydrogeology and numerical modelling. That observation does not contradict B.28. Much of that work was expressly recommended by it.

For example, B.28 recommends further investigation to confirm or refine assumptions; three-dimensional numerical modelling; more detailed underground geotechnical assessment; further structural assessment; hydrogeological investigation and monitoring; and, where relevant to the depth of underground development, measurement of in-situ rock stress.

The substantive disagreement is therefore not principally about whether further work is desirable or required, but when that work must be completed and what conclusions may reasonably be drawn at the present stage of project development.

4. Treatment of uncertainty

Geotechnical design necessarily deals with a naturally heterogeneous geological medium. Increasing the quantity of investigation data improves understanding of the rock mass but does not and cannot eliminate natural variability.

B.28 specifically recognised this point. Existing data were considered reasonable while acknowledging the inherent variability of the RAS country rock, and it was noted that additional testing would not necessarily reduce the observed spread of properties. Importantly, the weakest materials that may influence behaviour can themselves be difficult or impossible to test meaningfully.

It is therefore inappropriate to treat every identified uncertainty as though the adverse end of its possible range necessarily applies simultaneously throughout the mine.

A sound geotechnical assessment instead requires consideration of:

- the credible range of conditions;
- their likelihood and spatial persistence;
- the mechanisms by which they could affect mine performance;
- the consequences of those mechanisms;
- the ability to investigate them further before they become relevant; and
- the ability to observe, monitor and respond to actual ground behaviour as mining progresses.

The distinction is important. Uncertainty is not itself evidence of an adverse condition.



5. Groundwater & the partially saturated slope case

Professor Emerman notes that the calculated static factor of safety (FOS) for one partially saturated RAS north-east slope case was 1.42 and asks what would occur if the slope were saturated. He characterises the FOS of 1.42 as meaning that the slope "will be unstable when it is partially saturated".

That interpretation is too categorical.

A calculated FOS of 1.42 does not mean that a slope will be unstable. It indicates that the calculated margin against the particular modelled failure mechanism, for the assumptions adopted in that analysis, is 1.42. Whether that represents an acceptable design condition depends upon the design stage, consequence of failure, confidence in parameters, groundwater assumptions, three-dimensional geometry, monitoring and other controls.

Similarly, complete saturation of a pit wall is a possible analytical scenario but should not automatically be adopted as the design condition unless hydrogeological evidence indicates that it is credible.

B.28 did not ignore groundwater. It identified groundwater pressure as a destabilising influence, recommended pit-wall depressurisation, piezometric monitoring and management of surface runoff, and explicitly recognised that transient pressures could still occur even with depressurisation measures.

The appropriate response to uncertainty concerning groundwater is therefore to characterise, monitor and manage groundwater and analyse credible groundwater states, rather than simply substitute the maximum conceivable groundwater condition for the conditions expected to occur.

6. Factor of Safety

Professor Emerman's preference for a minimum static FOS of 1.5 is understood. His argument is essentially that greater uncertainty warrants a larger design margin.

That is a valid principle, but it does not follow that FOS 1.5 must be imposed universally at the present stage irrespective of slope sector, failure consequence, geological confidence, groundwater condition or ability to monitor the slope.

The quoted range of 1.3–1.5 is properly understood as design guidance rather than a single mandatory value. Selection of an appropriate design acceptance criterion requires engineering judgement informed by consequence and confidence.

There is also a distinction between operational slope design and the long-term condition required for closure and relinquishment. Professor Emerman's comments concerning progressive deterioration and reduced monitoring after closure are reasonable considerations. They support explicit consideration of long-term closure performance; they do not establish that every operational slope must necessarily be designed initially to FOS 1.5 or 2.0.

Final walls that are required to satisfy a particular long-term closure criterion must plainly be configured so that this outcome remains achievable. That requirement can be incorporated into detailed design as knowledge of the rock mass, groundwater regime and actual wall performance improves.

7. In-situ stress

Dr McAlpine correctly identifies that the actual RAS in-situ stress field has not yet been measured and that tectonic stresses are likely to be non-isostatic. His evidence concerning regional strain and earthquake focal mechanisms is relevant to establishing an appropriate stress regime for future numerical analysis.



The conclusion that use of an isostatic stress state is therefore necessarily the "most implausible and optimistic design assumption", however, is not demonstrated.

The influence of stress upon excavation stability depends not simply upon the average magnitude and inferred orientation of the regional stress field but upon local stress orientation, excavation geometry, depth, rock-mass strength and anisotropy, structures and stress redistribution caused by excavation.

The appropriate response is the one already contemplated: use preliminary assumptions for sensitivity assessment, obtain site-specific stress measurements at the appropriate stage, and revise three-dimensional modelling accordingly. An assumed stress state in a preliminary model should not be confused with an assertion that the assumed state represents the actual RAS stress field.

8. Macraes as an analogue

The experience at Macraes is highly relevant and should be used to inform RAS design. B.28 itself recognised the value of the PSM assessment partly because PSM could draw upon direct experience at Macraes, which has a broadly similar geological/geotechnical setting although significantly different topography.

However, experience of instability at Macraes does not establish that equivalent instability will occur at RAS.

The Macraes examples demonstrate that large open pits developed in structurally complex schist require careful structural interpretation, groundwater management, appropriate design, monitoring and adaptation. They are valuable lessons and analogues, not deterministic predictions of RAS performance.

Indeed, the occurrence and subsequent management of slope instability at established mines is one of the mechanisms by which practical understanding of rock-slope behaviour advances. A mine with a long operating history provides an enormous observational dataset, and managed instability does not necessarily represent design failure. In open-pit mining, there is a fundamental distinction between ground movement, controlled instability and uncontrolled slope failure with unacceptable consequences.

9. Progressive design & observational control

A mine is an evolving structure, growing relatively slowly to a final configuration and cannot be constructed instantaneously to its ultimate geometry. With each stage, open pit development exposes previously inaccessible geological and structural information.

B.28 explicitly considered ongoing assessment of actual conditions and observed wall performance to refine geological and geotechnical models and to confirm or modify wall design parameters.

This is not a substitute for adequate pre-mining investigation. It is, however, an important and conventional component of geotechnical mine design.

Slope stability is not assessed solely by calculating a FOS at the design stage. Once a pit is being excavated, the actual response of the rock mass becomes observable and measurable. Monitoring can establish whether deformation is absent, stable, accelerating or approaching a potentially unstable condition.

There is consequently a practical distinction between information which must be established before mining commences and information which can appropriately be refined before the relevant excavation is reached. Requiring feasibility-level or final-design resolution of every geotechnical uncertainty before approval would disregard the staged nature of mine development and the substantial amount of geological information that becomes available only through excavation.

Treating every uncertainty identified at PFS stage as though the worst conceivable condition must already exist is overly simplistic. Progressive excavation provides increasing geological exposure and, importantly, direct measurement of the behaviour and assessment of the capacity of the rock mass.

10. Conclusions

The supplementary evidence of Professor Steven Emerman and Dr Alexander McAlpine raises legitimate matters concerning uncertainty, groundwater, in-situ stress, three-dimensional behaviour, closure performance and the need for continued investigation. These matters should not be dismissed, and haven't been.

However, most were already recognised in Document B.28 submitted as part of the substantive application and many formed the basis of its recommendations for further work.

In our opinion, the principal difference is one of interpretation. The supplementary evidence tends to move from:

"this adverse condition is possible and has not yet been excluded"

to an implicit position that:

"this adverse condition should therefore be assumed to apply unless and until it is disproved."

That is an unnecessarily deterministic treatment of geotechnical uncertainty.

The more appropriate approach is to establish a credible range of conditions, assess sensitivity to those conditions, undertake additional investigation where the outcome could materially affect design, and progressively refine and validate the geotechnical model against information obtained during mine development.

It is normal for feasibility conclusions to be conditional upon the subsequent resolution of identified uncertainties. Some investigations are appropriately deferred because they are costly, require specialised drilling, testing or analysis, or are most efficiently undertaken once the project configuration has been sufficiently established. The relevant question is therefore not simply whether uncertainties remain, but whether those uncertainties have been identified, whether there are reasonable means of resolving them, and whether credible outcomes from those investigations could be accommodated through subsequent refinement of the design.

B.28 should therefore be read for what it was: a pre-feasibility-level reassessment of an existing PFS geotechnical database and mine concept, supplemented by site inspection, core inspection and independent review. It identified both limitations and risks and recommended the additional investigations necessary to advance the design. The fact that such work remains to be undertaken is not, in itself, evidence that the present geotechnical assessment is unsound or that the Project cannot appropriately proceed to its next stage, nor that geotechnical risk cannot be managed appropriately as the project develops.



11. Closure

We trust that the information provided meets your requirements.

Please contact the undersigned if there is any need for clarification or comment on these or other geotechnical issues.

PETER O'BRYAN & Associates

per:

A handwritten signature in black ink, appearing to read 'PRO'Bryan', with a long horizontal stroke extending to the right.

Peter O'Bryan

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Principal

