Technical Memorandum

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Introduction

Two slope failures occurred on 5 January 2025 and 14 January 2025 within the property boundaries of 10-12 View Point Road, McCrae, Victoria; damaging 3 Penny Lane, McCrae, Victoria. The landslides comprised the downslope movement of a significant volume of material from the upper portion of the slope within 10-12 View Point Road. This material accumulated within the 3 Penny Lane property near the toe of the slope. The landslide caused substantial damage to the property and injury to a person who was at the property at the time of the 14 January 2025 landslide.

SMEC Australia Pty Ltd (SMEC) has been engaged by South East Water (SEW) c/o Thompson Geer to provide technical advice relating to the 2025 landslides. This scope of work was to assess whether the contribution the water main leak at Bayview Road may or may not have had in triggering the slope failure events. As part of this technical advice, SMEC has undertaken limited geotechnical investigations in the locality upslope of the landslide. The purpose of the geotechnical investigations was to obtain information about the subsurface conditions to inform the formulation of the ground model for the area.

As part of these investigations, SMEC has undertaken hydrogeological investigations, including geochemical analyses in addition to those were presented in SMEC Report 002 Appendix E. The objective of this technical memorandum is to provide further understanding of the provenance of water quality results based on the scope and results of the additional works.

Further Geochemical Analysis

Further understanding of the provenance of the different observed water types has been made. This has been done through geochemical analysis that was undertaken to complement that previously reported in SMEC Report 002 Appendix E.

Figure 1 provides a summary of the overall assessment for water types in the form of a Durov Diagram which allows for a visual inspection of the data at a single point while considering various chemical parameters. A Durov Diagram is a graphical method used to display the chemical composition of selected components of a water sample (i.e., four predominant cations as Na^+, K^+, Mg^{2+} and Ca^{2+}; and four predominant anions as Cl^-, $HCHO_3^-$ + CHO_3^{2-} and SO_4^{2-}) and provides a visual summary of the water types. The Durov Diagram shows a grouping of three water types:

- Shallow perched aquifer Colluvium
- Shallow perched aquifer at interface of Granite and Colluvium

- Granite

These three water types are labelled on Figure 1.

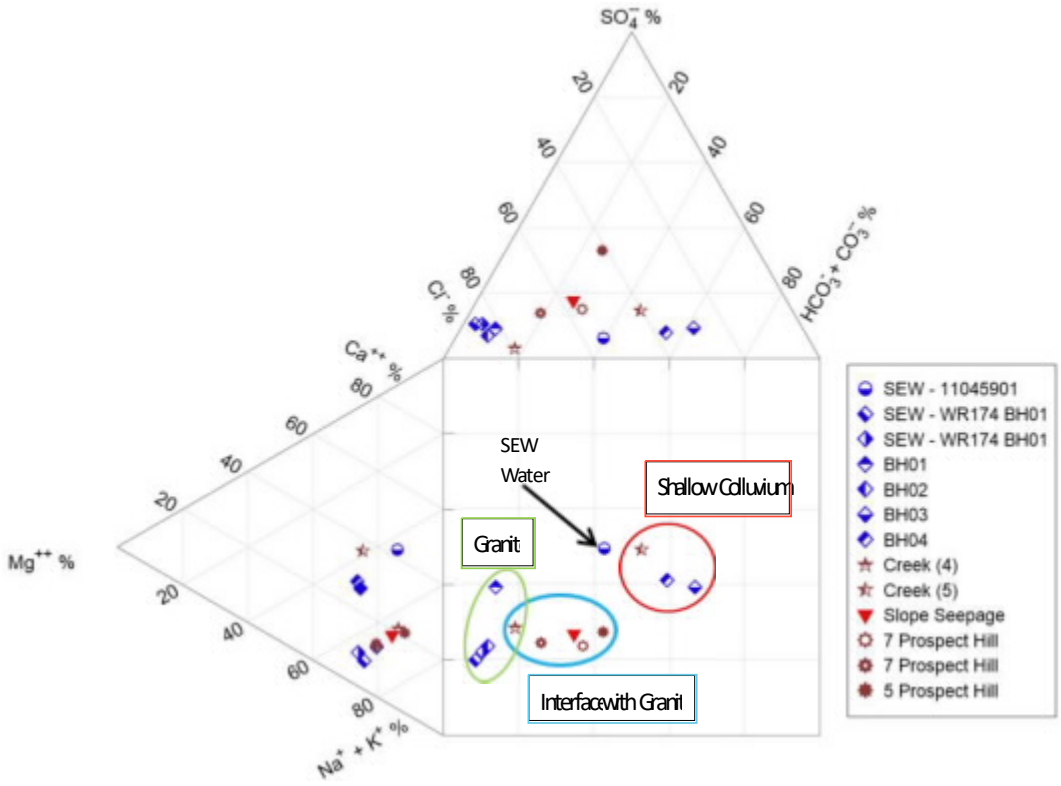

Figure 1: Durov Diagram for Selected Water Samples

The shallow perched aquifer colluvium water type sits aside from the other two water types. The landslide water ("Slope Seepage") has a comparatively higher sodium and chloride signature when compared to the colluvium. This is a result of the groundwater associated from the landslide seepage being at the interface with the granite. It is assessed that this is because it has partially taken on its characteristic sodium chloride signature.

Groundwater adjacent to the building foundation drainage system at 5 and 7 Prospect Hill has a similar signature to the landslide water sample. This indicates that the colluvium granite interface water is being captured by their building foundation drainage systems.

Also shown on the Durov Diagram are two different samples from Coburn Creek. Coburn Creek is a discharge point for groundwater. Sample labelled "Creek (4)" is located further up catchment at Browne Street whereas Creek (5) is located at Burrell Street. Creek (4) had evident exposed weather granite upstream whereas Creek (5) did not. Photos of the exposed weathered granite are shown in Photo 33A and 33B as per PSM report (MSC.5087.0001.0414).

This above analysis indicates that the landslide water seeping for the face of the slope shortly after the January 2025 landslides was natural background water. This fits with the conceptual model being presented of water flowing from the interface with the granite. This seepage flow still continues to this day and would have occurred prior to the landslide.

Conclusion

Based on further geochemical analysis the landslide water seeping for the face of the slope shortly after the January 2025 landslides was natural background water and fits with the conceptual model being presented of water flowing from the interface with the granite.