

## Observations on comparative geological interpretation of two different resistivity surveys for the same landslide prone area

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**Abstract:** All resistivity survey interpretation must be used with caution. When well done and supported by ground truth exercises they can be a valuable aid to site investigation, depending on quality of resistivity survey and the skill and the background of the interpreter. A situation has arisen where two interpretations on resistivity surveys of a landslide prone area were made by two different interpreters. This is used as an opportunity to illustrate the potential difficulty in obtaining a reliable interpretation. A case study of these two geophysical resistivity surveys done by different operators on a same location was examined. The area was a known potential geohazard zone, situated on a steep hillslope with a proposed excavation to make way for development. First resistivity survey (9 lines) was done in 2014 to complement the initial site investigation and utilized for infrastructure and excavation design purposes. No comment on geohazards and geological constraints were made in this report. However, upon excavation, multiple issues were stumbled upon on site including boulders, groundwater, and slope instabilities. This situation prompted

the consultant to conduct comprehensive geological study in late 2017 including another resistivity survey (6 lines). The resulting pseudosections from second resistivity survey show multiple interpreted boulders and groundwater infiltrations akin to a colluvium deposit beneath the surface. Subsequent mapping and geological study confirms the findings, with paleo debris flow suspected responsible for the deposit based on topography. These new findings prompted new drawings and mitigation structures to be designed, further delaying the project. This study highlights the need for a proper geological approach in geophysical survey, as potential geohazards were overlooked in the first survey due to poor data analysis and presentation. Overlooked geohazards, in turn posed problems to the project itself, catching consultants and contractors off-guard, causing costly delays and structures re-design in later stages. Improved data presentation and interpretations were employed in the second survey, with proper geological approach, to assist the designers and engineers to better understand and mitigate potential geohazards.