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(a) Qualitative Approach

By visually estimating the variation in the slope of the Hz profiles, we can determine the location of the second derivative maxima and its wavelength. We can use this information in conjunction with Hz data, to estimate the shape of the source and its depth to top. In particular any sudden changes in the slope are to be understood as indicating a shallow edge to a conductive unit, or an abrupt variation within a wider conductor.

UTEM scale model data in Figure 2 adapted from Macnae *et al* (1983), shows that every edge within a conductor, (in this case representing variations within the overburden), corresponds to one of the maximum changes in the slope of the profile. Away from these second derivative peaks the slopes are relatively constant, indicating a 'narrow' second derivative and therefore that the source is shallow. This is supported by the fact that the peaks in the second derivative are also close to the minima and/or maxima of the anomaly due to the variations in the overburden as

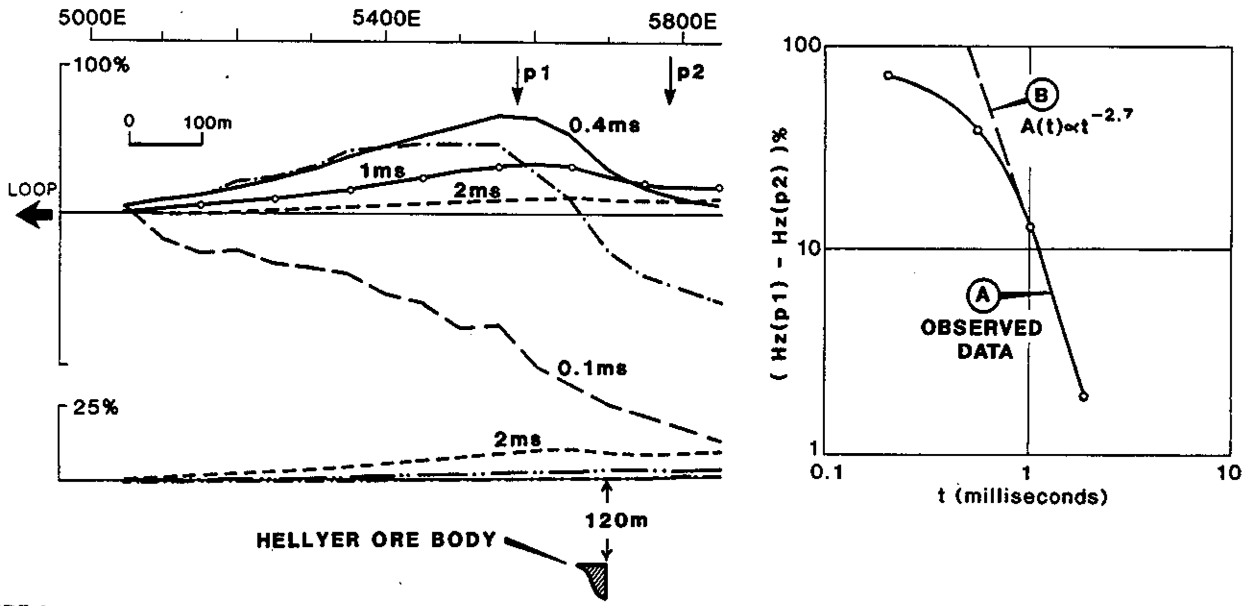

FIGURE 3
UTEM (Hz) data from Hellyer ore body. The variation in the slope of the profile is continuous and smooth indicating a broad second derivative. No obvious edge effects are evident. The decay between the two arrows is dominated by a $t^{-2.7}$ power law decay, and so a current-gathering effect is inferred.

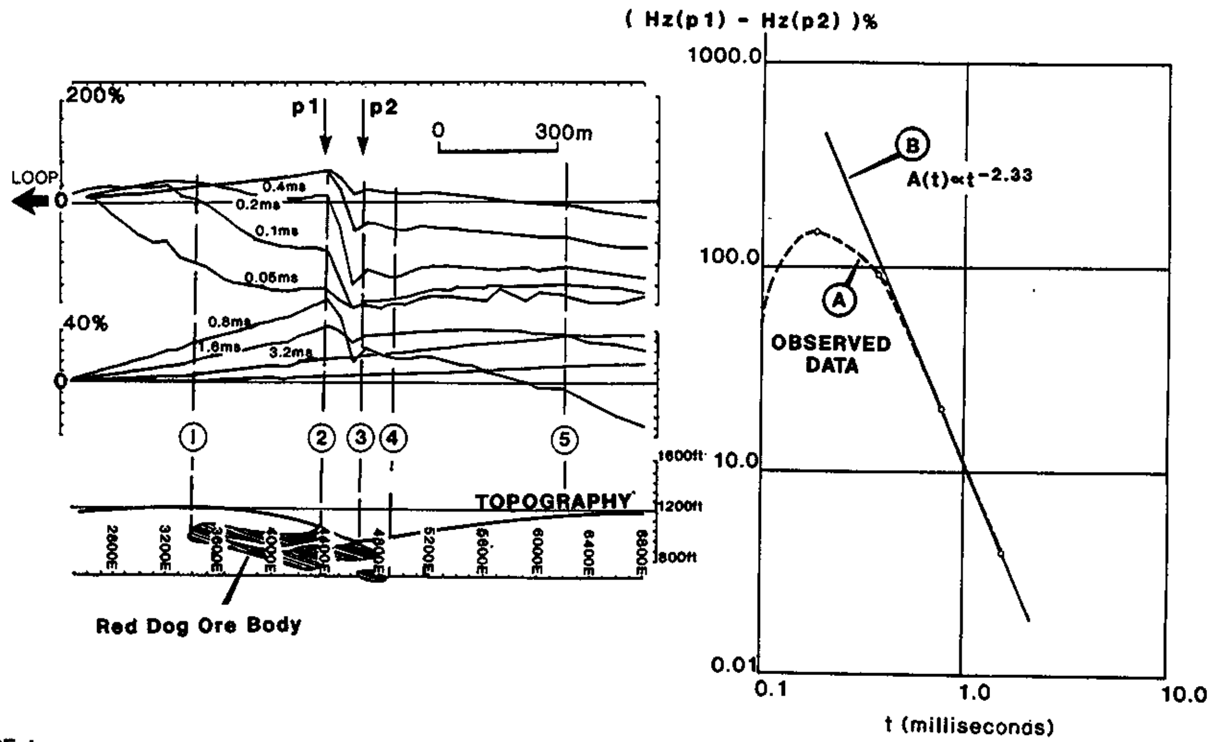

FIGURE 4
UTEM (Hz) data from Red Dog deposit, Alaska. Maximum changes in the slope of the profile correspond to the edges of the orebody. Smoother changes correspond to the deeper terminations. Edge 5 outlines a nonprospective outcropping conductor. The decay analysis for the data between the two arrows, shows that a $t^{-2.33}$ 'late' time asymptote dominates.