APPENDIX A

SOME PROCESSING ISSUES WITH SOUTH HENTY TEM DATA

Three problems arise in interpreting borehole EM data on this prospect.

1) Background resistivities are high, with the result that signal strengths are low, and the self response of the borehole probe becomes an issue in distinguishing genuine from instrumental anomalies. The probe self response is best identified by either computing the shape of the primary field profile down the borehole, or by comparing the TEM profiles with the "primary" pulse amplitude as recorded by the Crone PEM receiver. Both have been done in trials with this data, and found to give similar results. In consequence the latter technique has been applied routinely (a faster process). The importance of the comparison of profiles with the primary field pulse, when interpreting data from multiple transmitter loops, makes the plotting of absolute amplitudes of the primary pulse a necessity.

2) The low signal strengths combined with high electrical (powerline) noise in parts of the prospect, result in noisy data in late channels, which tend to obscure subtle signatures of off-hole conductors. This problem is greatly alleviated with the use of two-dimensional filtering of the data prior to plotting (a facility exclusively available to Flagstaff GeoConsultants).

3) The Crone PEM data acquired is routinely presented by the contractor in digital form, but not normalised for transmitter current. When comparing signal strengths from two or more transmitter loops (which typically use different transmitter currents), it is necessary to normalise data to units of nT/amp/sec, rather than the original nT/sec.

The effect of items (1) and (2) above is illustrated in Figures A1-A4.
Figure A1 shows profiles for Loop1, Hole SHD1, with the primary field over-plotted in red. The primary field is strong for this transmitter (encompassing the collar of the hole) and the shape of the profiles largely mirrors the primary field, ie the evidence evidence for an off-hole conductor is dubious. Figure A2 shows the same data after two-dimensional filtering. At late time windows, the profiles go negative while the primary field remains positive, thus it is possible to deduce the presence of a genuine off-hole conductor near the base of the hole. Figures A3 and A4 show similar plots for the same hole SHD1, with transmitter loop 2 (centred 700 m west of the hole collar). In this case, the shape of the profiles is quite different to the shape of the primary filed profile, and note the primary field strength is a factor of 30 smaller