

Magnetic Modelling And Petrophysical Data From The Musgrave Ranges, SA

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Following acquisition of detailed aeromagnetic data by Primary Industries and Resources South Australia (PIRSA) within the Musgrave Block of South Australia a program of reconnaissance drilling was planned. The drilling program was designed to provide geological, geophysical and geochemical information in an area that has not been actively explored on a large scale for almost forty years.

Initial location of the drill holes was based on interpretation of the regional aeromagnetics. The aim of the drilling program was to define occurrences of the highly prospective ultramafic – mafic Giles Complex and the Birksgate Gneiss. Drill holes were also planned to test structures observed on the regional aeromagnetics. To further define the drill hole locations a series of detailed ground magnetic profiles were acquired.

Due to time constraints and a lack of petrophysical data, modelling of the ground magnetic profiles was initially limited to qualitative methods rather than forward modelling. Results of the drilling program allowed more complex geophysical models to be generated. The results of these models could be used for a future drilling program. Density and magnetic susceptibility values were subsequently measured for both the target lithologies and country rock. These petrophysical properties along with the geological and geochemical data obtained will be invaluable in planning future programs in the area.