

A comparison of porosity values inferred from
magnetotelluric and bore-hole density data; case
studies from two geothermal regions in South
Australia

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ABSTRACT

Porosity is one of the main determining factors of the prospectivity of geothermal regions and can be estimated in a number of ways from geophysical surveys. The objective of this work was to better understand the link between porosity, permeability and electrical resistivity through Archie's law. This was achieved by comparing porosity values derived from magnetotelluric (MT) data with those derived from density measurements taken in a petroleum borehole. Two case studies were used and are located in north-eastern South Australia. The outcomes of these studies will help to minimise exploration risk by proving the effectiveness of MT as a primary survey of geothermal regions. This study provides a stepping stone to understand the ways in which permeability can be determined from MT surveys in order to better quantify expected fluid flow rates in geothermal prospects.

KEYWORDS

Porosity, Geothermal, Magnetotellurics, Resistivity, Density, Archie's law, permeability.

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