

IN SITU VALIDATED SPECTRAL DATA (350 TO 2500 NM) ON AVANCED ARGILLIC ALTERATION ZONES OF THE COMBARBALÁ AREA, CENTRAL NORTH CHILE.

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In the Combarbalá area, located in the Central North of Chile (31°19' S/70°50'W), crop out rocks of the Quebrada Marquesa Formation of Early Cretaceous age. They represent a lower andesitic sequence and an upper section of reddish volcanoclastic sediments overprinted by a variable intensity of silicic and advanced argillic alteration. The upper part of the sequence hosts a strongly altered horizon that includes several mines where altered volcanoclastic rock "Combarbalita" is extracted as ornamental stone; its mineralogy is dominated by kaolinite, alunite, quartz, and minor hematite, rutile, anatase and pyrophyllite. The area corresponds to a high sulphidation environment, due to the interaction of meteoric water with magmatic vapour, with the formation of high acidic fluids (pH less than 1.5) that have selectively affected the highest structural levels of the geothermal system. Radiometric spectra of different types of altered rocks were in situ measured with a portable FieldSpec FR device using wavelength between 350 and 2500 nm with sampling intervals of 2 nm. Kaolinite-alunite-silicic, hematite-limonite-jarosite and silicic alteration zones, display characteristic spectra, in the visible and infrared zones, allowing us to validate satellite data and to recognize the different types of rocks and alteration products on the mapped area based on band ratios and mathematical algorithms of satellite TM data imagery.