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STRUCTURAL AND SEDIMENTOLOGIC STUDY OF CERRO PRIETO GEOTHERMAL FIELD, BAJA CALIFORNIA, MEXICO

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Since 1977 the Comision Federal Electricidad of Mexico and the Lawrence Berkeley Laboratory have cooperatively studied the Cerro Prieto geothermal field, located approximately 35 km south of the United States-Mexican border in the Mexicali-Salton trough.

As part of these studies, geophysical and lithologic well logs have been qualitatively and quantitatively studied using both manual and computer interpretation techniques. These logs were analyzed to make stratigraphic correlations throughout the Cerro Prieto field and to interpret the depositional environment of the field's lithologic units. Dipmeter and seismic data were of noted value in making stratigraphic interpretations and predictions. Cross sections were constructed to illustrate lithofacies variations throughout the geothermal field. These sections were used to construct a three-dimensional model of the Cerro Prieto geothermal reservoir.

Petrographic, SEM, and X-ray diffraction analyses were made of the well bore cuttings to determine the degree and distribution of hydrothermal alterations, the origins of secondary porosity, and the relative degree of fracture and dissolution porosity. These analyses were corroborated by log-derived formation fluid properties, porosity, and petrophysical data, and by petrophysical analyses of Cerro Prieto core conducted under in-situ conditions. The results of these studies were integrated into the Cerro Prieto reservoir model.

These studies have resulted in a better understanding of a major hydrothermal resource. This enhanced comprehension will contribute to the efficient development of not only this geothermal field but will serve as a model for development of similar resources.

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