

Petrography of a Foraminite Unit from Railroad Gap Oil Field, Kern County, California

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A study of a foraminite unit within the Railroad Gap oil field was undertaken in order to explain variability in reservoir quality within well 375-15Z. The section studied lies within a foraminite unit at depths from 6600 to 6800 ft. The reservoir quality and production response within this 200-ft-section has been found by ChevronTexaco to vary dramatically over a short distance. The oil well is located in Section 15, T30S, R22E, within the Railroad Gap oil field, which lies on the west side of the southern San Joaquin Valley in Kern County, about 1.5 mi northeast of the town of McKittrick. The foraminite unit falls within the late Oligocene to middle Miocene Temblor Formation at the Luisian/Relizian benthic foraminiferal stage boundary.

This study involved collecting petrographic data from sixteen (16) thin sections made from a core taken from well 375-15Z. The petrographic analysis focused on porosity, permeability, depositional environment, and diagenetic features of the foraminite unit in order to explain the variability in reservoir quality within the 200-ft interval. The mineralogy consists predominately of clay, which ranges from 10 to 77% by volume. Other major constituents are phosphate, calcite, and dolomite. The amount of foraminifera ranges from 1 to 24% by volume, and they are found to be whole as well as crushed. Some foraminifera were observed to be dissolving or altering into microcrystalline dolomite or clay. Porosity varies throughout the section from 1 to 20% by volume and was observed to be mostly secondary and intraparticle due to the dissolution of calcite cement within the foraminifera. A direct correlation between porosity and the percentage of foraminifera was found. As the percentage of foraminifera increases, the porosity also increases. The permeability was observed to be related to the amount of crushed and broken foraminifer shells. Permeability is higher when more foraminifer shells are crushed but not filled in with clay or other shell fragments, creating interconnected pore spaces.