ed both the formation of early dolomite concretions and the reaction opal A → opal CT. We have found no evidence to suggest a smectite → illite reaction, probably due to the low activity of K^+ and the high activity of H_4SiO_4 during diagenesis.

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Oil and Gas Exploration Wells in Pedregosa Basin

In the Pedregosa basin and adjoining areas covering 49,500 sq mi (110,700 sq km) in southeastern Arizona, southwestern New Mexico, northwestern Chihuahua, and northeastern Sonora, 37 petroleum-exploration wells have penetrated Paleozoic and/or Precambrian rocks. Several shows of oil and gas have been reported, but no commercial production has been found to date. Many of the wells have been drilled on basin and range uplifts where reservoirs tend to be flushed with meteoric water. The best remaining prospects lie below the deeper parts of graben valleys where preservation of petroleum is more likely.

The highest ranking objective of the region is in Upper Pennsylvanian-Lower Permian rocks at the margin of the Alamo Hueco basin where shallow-marine dolostone reservoirs are juxtaposed to deep-marine, organically rich, limestone and mudstone source rocks. A regional isopach and facies map of the Pennsylvanian shows that the basin axis trends generally southeastward from southern Hidalgo County, New Mexico, across the Ascension-Villa Ahumada area of Chihuahua. Several other petroleum-exploration objectives are indicated in the Paleozoic and Mesozoic rocks.

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Stratigraphic and Structural Relations to Pre-Tertiary Rocks on Perimeter of Santa Maria Basin

On the perimeter of the Santa Maria basin three tectono-stratigraphic terranes of pre-Tertiary rocks are recognized. In ascending stratigraphical and structural order, these are: the Franciscan assemblage, the Coast Range Ophiolite, and the Great Valley sequence. Where exposed in the western Santa Ynez and San Rafael Mountains, the Franciscan assemblage is a melange of chiefly graywacke, argillite, chert, and blueschist rocks. The Coast Range Ophiolite forms a discontinuous tectonized belt of outcrops along the southwest edge of the San Rafael Mountains; parts of the dismembered ophiolite are exposed at Cuyama Gorge, Tepusquet-Colson Canyon, north side of Figueroa Mountain, Little Pine Mountain, and Santa Ynez River west of Gibraltar Dam. Rock types include harzburgite, pyroxenite, gabbro, diorite, pillow basalt, tuff, and serpentinite. Throughout the ophiolite belt, serpentine-rimmed cold intrusions invade sedimentary strata as young as middle Miocene. The Great Valley sequence includes Tithonian through Maestrichtian submarine-fan strata as well as fluviodeltaic strata of probable Campanian age. The latter crop out in the Sisquoc River area directly west of the Sur-Nacimiento fault zone. Along the north flank of the Santa Ynez Mountain, structural superposition resulting from truncation along thrust planes has juxtaposed beds as young as Valanginian above the Franciscan assemblage.

The structural and stratigraphic relations of the three terranes support the concept of a regionally persistent late Mesozoic forearc basin and accretionary subduction complex that may have extended from the Klamath Mountains of Oregon to as far south as the Vizcaino Peninsula of Baja California, Mexico.