
Resuscitating the Vintage Indio Field Using New Exploration Technologies, Zavala County, Texas

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EXTENDED ABSTRACT

In 2007, H. H. Howell, Inc. reopened production on the abandoned Indio Field in Zavala County, Texas (Fig. 1), by successfully integrating conventional subsurface geology, 2D and 3D seismic, and soil-gas geochemistry data to produce significant untapped hydrocarbons in this complexly faulted, oil-productive feature.

Indio Field lies geologically in the Uvalde volcanic field portion of the Balcones Igneous Province of South Texas, just updip of the Pearsall (Austin Chalk) Field, and at the eastern edge of the Maverick Basin. Indio Field is an example of the numerous oil and gas fields in the trend associated with small, submarine volcanic centers that were active near the end of Austin Chalk deposition, and the beginning of Taylor Group time. Most of the production associated with these volcanic tuff mounds, or ‘serpentine plugs,’ is oil from the Taylor Group’s Olmos and San Miguel-aged sandstones that drape, and overlay these igneous features. Production can be quite prolific. Since their discovery in 1915, oil and gas fields associated with this South Texas serpentine plug trend have produced about 47 million barrels of oil and significant quantities of natural gas (Ewing and Caran, 1982; Matthews, 1986).

The uppermost Olmos sand, and the basal San Miguel sand (locally called ‘Elaine sand’), both produce at Indio Field, with the Elaine sand being the most important. The San Miguel sands were deposited in wave-dominated delta systems (Weise, 1980), forming strike oriented and relatively blanket-like sand bodies. The Indio serpentine plug then becomes the trapping mechanism, as the overlying reservoir sands are faulted around the plug. These sands are oil-prone in the Indio Field area, and sand conditions are usually sufficient to produce naturally (without stimulation).

Indio Field was discovered in 1960, when the General Crude Holdsworth #1 well free-flowed 122 barrels of 34.8° gravity oil per day from 19 gross ft of Elaine sand. Further development revealed the Holdsworth #1 was draining a downthrown, northeast fault segment on the northeastern flank of the Indio plug feature.

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