

Shake'n L.A.: How Plains Exploration and Production Co. Acquired 21 Square Miles of 3-D Seismic Data in Urban Los Angeles, California

Dalton Lockman¹, Steve Rusch¹, and Brad Clark²

¹Plains Exploration and Production Company, Los Angeles, CA

²Rincon Energy LLC., Carpinteria, CA

dlockman@plainsxp.com

The Inglewood oil field is located along the Newport-Inglewood Fault trend in the seemingly continuous urban area of the Los Angeles Basin, California. The field has undergone several phases of development since its discovery in 1924. The field's initial development was based solely on drilling topographic highs. During the first 30 years of the field, wells were drilled to over 12,000 ft to explore and develop the Pliocene through mid-Miocene formations using only geologic mapping techniques. Secondary recovery projects by waterflooding were initiated in the shallow reservoirs in 1954, and by 1986, the field was rapidly maturing with increasing water cuts and expenses. In 1990, Plains Exploration & Production (known as Stocker Resources at that time) acquired the field. Over the next ten years, field work focused on production engineering, facility issues, and mapping current hydrocarbon saturations. Results from drilling new wells indicated that geologic structure was a dominant factor in accurately identifying areas in the reservoir with these reserves.

In early 2001, Plains initiated a significant effort to resolve the structural complexity of the Inglewood field, characterize the reservoir, explain waterflood issues, and exploit hydrocarbons that were underdeveloped in the past or had not yet been identified. One of the key technology tools that had not been used was 3-D seismic. A feasibility study, which included shooting a 2-D line, pointed to potentially good results from acquiring 3-D data over the entire field.

With thorough planning and diligent permitting, 21 mi² of 3-D seismic data were acquired in 2003 within the boundaries of 4 municipalities. The field operation was not without numerous technical and cultural challenges. These challenges included problems related to topographic variability, fold design for steep dip, and layout constraints, as well as issues dealing with theft, traffic, damage to structures, pollution, and public fear. Perseverance paid off, however, and the pre-acquisition plan became a reality after 2 months of data acquisition.