

## **Prolific Megabreccia Reservoirs In Railroad Valley, Nye County, Nevada: Key To Future Discoveries**

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### **ABSTRACT**

The term megabreccia conjures a variety of mental images. Landis (1945) described units containing large, randomly oriented blocks. Longwell (1951) applied the term to gravity-slide deposits. Cook (1984) described megabreccias in carbonate slope and basin settings. We use the term for thick, generally homogeneous units, usually with extensively fractured and sometimes cavernous texture. In the Basin-Range, these units are encased by syntectonic Miocene-Pliocene valley-fill deposits and were emplaced under the influence of gravity as landslides. A Neogene landslide deposit beneath Railroad Valley was first encountered at the Shell Oil No. 1 Eagle Springs Unit, discovery well for Nevada's first oil field. Valley fill was drilled to about 3,265 feet, where cuttings abruptly changed to Paleozoic dolomite and limestone. After drilling 215 feet, the cuttings returned to sand, silt, and clay typical of valley fill. This was interpreted as a Paleozoic block that resulted from a massive rock fall or slide from the adjacent Grant Range (Peterson, 1994.) Subsequent exploration established production from megabreccias at four fields in Railroad Valley. A production test at the Balcron No. 23- 17A Bacon Flat well demonstrated the highly permeable nature of a megabreccia reservoir, flowing at a rate greater than 13,000 barrels of oil per day. The Mapco No. 3 and 4 Grant Canyon wells flowed steadily for six years at combined rates up to 8,000 barrels of oil per day. Wells in Kate Spring and Ghost Ranch fields flowed over 1,700 barrels of fluid per day. The exploration experience in Railroad Valley shows that well cuttings and most wireline logs can be used to distinguish deposits of megabreccia from sand, silt, and clay typical of valley fill. Small-scale rock texture can be identified with whole core and image logs. However, interpretation of megabreccia texture at the reservoir scale requires data from a larger volume, such as seismic, production performance, or correlation of adjacent wells. This requires the correct stratigraphic interpretation, which can be difficult where the base of a megabreccia is not completely penetrated or directly overlies bedrock. In addition to the fields, a number of wildcat wells in Railroad Valley have also encountered Neogene landslides. Some of these have been misinterpreted as reaching total depth in bedrock. The well control defines an area of approximately 30 square miles that is prospective for the discovery of megabreccia reservoirs. Furthermore, the model for megabreccia reservoirs as landslide deposits can be applied throughout the Basin-Range physiographic province.