

NMOCD JULY 11, 2002 HEARING

**PROPOSED CONTRACTION VERTICAL LIMITS UNITIZED FORMATION**  
**E-K QUEEN UNIT**  
**E-K YATES-SEVEN RIVERS-QUEEN FIELD**  
**LEA COUNTY, NEW MEXICO**

## **GENERAL HISTORY AND GEOLOGY**

The E-K Yates-Seven Rivers-Queen Field, discovered during 1954, is located in Sections 12, 13, 14, 23, 24 and 25 of Township 18 South, Range 33 East and Sections 7, 8, 17, 18, 19, 20, 29 and 30 of Township 18 South, Range 34 East, Lea County, New Mexico.

Although there has been a very small amount of Field oil production from the Yates and Seven Rivers sands, the major portion of oil produced from the E-K Yates-Seven Rivers-Queen Field has been from the Queen sands of the Permian System.

The productive zones of the Queen Formation are known locally as the Upper Queen sand, Main Queen sand and Penrose (Lower Queen) sand found at depths ranging from 4300 feet to 4700 feet. Exhibit No. 1, Compensated Density Log of C. W. Stumhoffer Federal CS No. 1 located 660 feet from south line and 1980 feet from east line of Section 19, T 18 S, R 34 E, Lea County, New Mexico shows these productive Queen sands.

A major portion of the productive Queen sands in the E-K Yates-Seven Rivers-Queen Field were unitized into the E-K Queen Unit during 1965, and a very successful waterflood operation has been conducted in the Upper Queen sand and Main Queen sand. The Main Queen sand has been the major contributor of primary and secondary oil produced from the E-K Queen Unit.

Although the Penrose (Lower Queen) sand was included in the Unitized Interval under the E-K Queen Unit, it was not included in the waterflood development and operation. A map showing the boundaries of the E-K Queen Unit is presented as Exhibit No. 5.

A brief discussion of each of the productive Queen sands under the E-K Yates-Seven Rivers-Queen Field is presented below in order of importance:

### **MAIN QUEEN SAND**

The Main Queen sand is a fine to-medium grained, gray, quartzitic sandstone. The oil bearing reservoir sand appears to be a wedge or bar type deposit with red silty sandstone having calcareous or anhydrite cementation, both overlying and underlying the productive interval.

The Main Queen sand is encountered from 25 to 40 feet below the top of the Queen Formation. The net pay in this zone is from two (2) to sixteen (16) feet thick.

## **UPPER QUEEN SAND**

The Upper Queen sand is productive under the central portion of the E-K Queen Unit and appears to be a northwest-southeast trending porosity development.

This zone is found at or near the top of the Queen Formation and is limited in areal extent and pay thickness.

## **PENROSE (LOWER QUEEN) SAND**

The Penrose (Lower Queen) sand is more erratic and more poorly developed than the Main Queen sand or Upper Queen sand.

This zone is found approximately 250 to 300 feet below the top of the Queen Formation and is productive in a small area slightly overlapping the south edge of the Main Queen sand development.

The bulk of Penrose (Lower Queen) sand production lies to the south and beyond the south boundary of the E-K Queen Unit.

Primary oil recovery from the Penrose (Lower Queen) sand has been approximately 400,000 barrels of oil. It is this Penrose (Lower Queen) sand productive area that Seely Oil Company proposes to unitize and develop for waterflood.