

Geologic and Engineering Discussion
Amended Unorthodox Rec Completions at Artesia (Glorieta-Yeso) Field
(ARCO's Washington "33" State # 26)
Section 33, T17S, R 28E, Eddy Co, NM

Summary:

ARCO Permian requests approval for recompletion of the cited unorthodox Washington "33" State well into the Artesia (Glorieta-Yeso) Pool. We now plan to recomplete this well in the Glorieta-Yeso, also and commingle the Yeso with the Artesia (Q-G-SA) Pool. Rec Completions of these old Abo wells are required for geologic, economic, and engineering reasons. All interests on this 600-acre State Land Office Lease No. X-00647 lease are common, and ARCO holds 100% of all rights down to the top of Abo shale.

Background of ARCO NSL Requests in the Area:

ARCO was granted NMOCD approval for re-completing each of these wells to the Artesia (Queen-Grayburg-San Andres) Pool by NSL 915-B.

Division Administrative Orders NSL-915-A, NSL-4003, NSL-4007, NSL-4035, NSL-4060, and NSL-4036 have also been granted for other unorthodox Artesia (Queen-Grayburg-San Andres) locations on the same lease.

Washington #9 and #14 , and Other Wells' Results:

In June 1998, ARCO completed Washington #9 in unit letter F of Section 33 for 28 BOPD, 65 MCFD and 716 BWPD, but the well has declined to about 10 BOPD. A copy of this log showing the Yeso dolomite pay is attached. Washington #14 in Unit letter H was also completed in June from the Yeso, and potential for 9 BOPD, 25 MCFD, and 863 BWPD, and now pumping around 40 BOPD. This new field has been designated the Artesia (Glorieta-Yeso) Pool. These wells also have uphole San Andres pay, as shown on the second attached log. Washington #1, 3, 5, 15, 18, and 28 are currently testing in the Artesia (San Andres).

Geology:

The Yeso (the upper part of which is sometimes called the Paddock Formation) is a fine-crystalline, anhydritic, slightly vuggy dolomite that lies under the Glorieta sand. The lower Yeso (which we are not producing from) is sometimes called the Blinbry, Tubb, and Drinkard in Lea County. A structure map of the top Glorieta sand, which is a better geologic marker than the Yeso, has been provided. This map shows up to 5-degree dip to the SE in Section 33, with the "crest" of the structure plunging due east, one mile north of us in Section 28. The gross 250' of Yeso pay we produce from is the same dolomite interval as found at Atoka (Glorieta/Yeso) Field, East Empire (Yeso) Field, and is the deeper Grayburg-Jackson (4000' San Andres) pay. This dolomite rarely produces without a major frac job.

The San Andres dolomite is an established pay from offset wells adjacent to our Washington lease, and maps showing top San Andres Structure and Gross Pay are included. The San Andres structure dips SE and is similar to the Glorieta structure. Gross San Andres pay interval across Section 33 ranges from 500 to 600'.

Engineering Justification for Revised NSL Request: