

**ENRON OIL & GAS COMPANY**  
***Application for Downhole Commingling***  
***and Special Allowable***  
**James Ranch Unit Development Area**  
**Eddy County, New Mexico**

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**Pools Involved:** Southeast Quahada Ridge - Delaware  
Los Medanos - Bone Spring  
South Los Medanos - Wolfcamp

**Producing Characteristics of each Formation:**

***Delaware*** - 6 producers in Development Area (see Exhibit No. 12)  
Average 1st mo. rates: 100 BOPD, 100 BWPD, GOR 1.5 MCF/BO  
Average 3rd mo. rates: 50 BOPD, 80 BWPD, GOR 1.5 MCF/BO  
Initial BHP: 3,200 psia to 3,400 psia  
Perforations: 7,200' - 7,600' for "C" and "D" sand interval;  
6,700' - 6,750' for "B" interval in the JRU No. 19  
Treatment: Acid ball-out. Hydraulic fracture w/30,000 gals. + 80,000 lbs.  
sand to 40,000 gals. + 200,000 lbs. sand.

***Bone Spring*** - 4 producers in Development Area (see Exhibit No. 13)  
Average 1st mo. rates: 120 BOPD, 20 BWPD, GOR 1.8 MCF/BO  
Average 3rd mo. rates: 47 BOPD, 15 BWPD, GOR 2.0 MCF/BO  
Initial BHP: 6,947 psig @ 10,909' in the JRU No. 71;  
5,734 psig @ 10,932' in the JRU No. 30  
Perforations: 10,880' - 10,938' in the JRU No. 71  
Treatment: Acid ball-out. Hydraulic fracture w/80,000 gals. + 325,000 lbs. sand.

***Wolfcamp*** - 1 producer in Development Area (see Exhibit No. 14)  
Average 1st mo. rates: 66 BOPD, 0 BWPD, GOR 0.9 MCF/BO  
Average 3rd mo. rates: 27 BOPD, 0 BWPD, GOR 0.9 MCF/BO  
Initial BHP: 7,069 psig @ 11,100'; after 6 months 3,725 psig SI 98 hrs.  
Perforations: 11,091' - 11,124' in the JRU No. 71  
Treatment: Acid ball-out. Hydraulic fracture w/24,000 gals. + 155,000 lbs. sand.

## **Reservoir Protection Issues:**

**Crossflow** - In wells in which only Bone Spring and Wolfcamp is commingled the SIBHP differential is about 122 psi. A flowing BHP gradient showed only 100 psia difference in the JRU No. 71. Additionally, after a few months of production the near wellbore pressures are drawn down approximately 50% because of the very low permeabilities (>0.2 md Eff).

In a well where a Delaware zone will be commingled the well will have artificial lift installed with bottom hole draw down to 500 to 800 psig, therefore, preventing any opportunity for crossflow. The initial SIBHP's of the Bone Spring formation in the JRU Nos. 30 and 71 adjusted to a Delaware datum of 7,500' is 4,688 psig and 6,100 psig, respectively. The Delaware pressures are more than 50% of the adjusted Bone Spring pressures (see Exhibit No. 15). The operator shall immediately notify the supervision of the Artesia District Office of the Division any time subject well has been shut-in for seven consecutive days and shall concurrently present, to the Division, a plan for remedial action.

**Oil and Gas Quality** - All oils are sweet and 41.0 to 43.1 gravity. All associated gas is delivered to a low pressure system with a processing agreement. The product prices received will not be affected by commingling the production.

**Water Compatibility** - The produced waters are compatible. (see Exhibit No. 16)

**Secondary Recovery Operations** - There is little potential for future secondary recovery operations for the Wolfcamp/Bone Spring interval due to depth and low permeabilities. Delaware is possible in the distant future. In that event, the zones could easily be isolated.

## **Allocation Procedure:**

The Bone Spring and Wolfcamp formations will be completed together initially and production monitored for 30 to 90 days or until stabilized. A production log will be run or the formations will be mechanically isolated and tested. A temporary plug will be set between the Bone Spring and Delaware intervals and the Delaware will be completed and tested for 30 to 90 days or until stabilized. The plug will be pulled and all/any zones commingled.

Allocation will be consistent with actual tests and closely compared to the expected rates based on offset production history of these formations.

**Special Allowable:**

It is requested that the daily allowable for commingled production be set as the top allowable of the shallowest zone commingled (i.e., 320 BOPD if Bone Spring; 187 BOPD if Delaware is the shallowest formation commingled). Standard gas limits rules should apply. A water production limit of 80 BPD per commingled zone is appropriate.

**Other Agency Approvals:**

The operator will still be required to satisfy other State and Federal agency requirements on an individual well basis.

**Results of Authority Approval:**

Additional Drilling and workover activity will result.

Correlative rights will be protected.

Waste will be prevented.

Operator will be allowed to develop reserves economically and efficiently.

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**BEFORE THE  
OIL CONSERVATION DIVISION  
Santa Fe, New Mexico**

Case No. 11424 Exhibit No. 11

Submitted by: Enron Oil & Gas Company

Hearing Date: November 16, 1995