Antelope Ridge Devonian Gas Pool - 1963 Hearing

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
December 4,1963

EXAMINER HEARING

IN THE MATTER OF:
Application of Shell Oil Company for the creation of a Devonian Gas Pool and for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the creation of a new Devonian gas pool for its Harris-Federal Well No. 1 located in Section 27, Township 23 South, Range 34 East, Lea County, New Mexico, said pool to comprise all of Sections 27, 28, 33 and 34, Township 23 South, Range 34 East,and all of Sections 3 and 4, Township 24 South, Range 34 East.

Case No. 2945

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

NMOCD Case No. 13085
EGL/Landreth Exhibit No. 8
October 2, 2003

Antelope Ridge Devonian Gas Pool
Special Pool Rules Hearing
December 4, 1963
Portions of Testimony Dealing with Technical Issues

Company in Case 2945?

A Yes, sir.

Q What is the purpose of Shell's application in this case, Mr. Stokes?

A We're making application for the establishment of a Devonian Gas Pool to be called the Antelope Ridge Devonian Gas Pool, and for special field rules for production from this pool. We're also requesting establishment of horizontal limits for the pool which are to consist of Sections 27, 28, 33, and 34 of Township 23 South, Range 34 East, and Sections 3 and 4, Township 24 South, Range 34 East.

Q What are the pertinent features, briefly, of the special rules that you intend to request, Mr. Stokes?

A Well, we intend to ask for 640-acre spacing and for well locations no nearer than 660 feet to the outer boundary of the interior quarter quarter sections. This, in effect, in a standard section would be no closer than 1980 feet to the outer boundaries of the section.

Q Do you have a plat of the area of the proposed pool?

A Yes. Exhibit 1 is a plat of the area. It shows the Antelope Ridge Unit outlined in red. We have two wells completed in the unit, the 1, th[illegible]is Federal No. 1 Devonian completion located in S ction 27. In Section 4 we have the Federal BE No. 1, which is a Morrow completion. This well is drilled to the Ellenburger and subsequently completed to the Morrow. We do

have a commercial zone in the Devonian but have not as yet completed the well in the Devonian. Both of these wells are shut in at the present time for lack of market.

Q Does this plat also show your structural interpretation of the Devonian formation in this area?

A Yes. The contours shown on the plat are on the top of the Devonian, and the data here is based on the well control furnished by the two wells, on seismic data, and on dipmeter data in Harris Federal No. 1. These data show the dip to the south, north, east, and west, with a gas-water contact at 11,450 feet subsea defining the productive limits of the pool on the north, east and south flanks, and a fault indicated by seismic data along the west edge of the unit boundary. Our water level has been proved by production and drill stem test data in the Federal BE No. 1. We recovered both gas and water on drill stem test from an interval that overlapped this 11,450 subsea.

We feel that our seismic fault on the west side of the structure is confirmed by differences in pressures and fluid content in wells in the Bell Lake Unit to the west. The pressure in the Bell Lake Unit at the time of our completion of Harris Federal No. 1 was approximately 6100 pounds, while the pressure in the Harris Federal No. 1 was 6360 pounds.

The Bell Lake Unit wells produced dry gas while both wells in the Antelope Ridge Unit have produced condensate of more than twenty barrels per million.

We also have tabulated on this exhibit the reservoir properties, which have been determined from log analysis and bottom hole pressure measurements. From log analysis we have determined an average porosity of 5.0 per cent, water saturation of 35 per cent, average net pay of 100 feet. From bottom hole pressure data we have found an original reservoir pressure of 6375 pounds per square inch absolute, and have calculated the permeability of 4.5 millidarcies from the slope of the pressure build-up curve.

Q This information that you have been giving is reflected on what has been marked as Exhibit No. 3 in this case?

A That's correct.

Q Referring now to what has been marked as Exhibit No. 4, is that the pressure build-up curve that you just referred to?

A Yes. This is a graphical presentation of the pressure build-up data with the pressures plotted versus dimensionless shut-in time, which would be "t" over "delta t" plus 1, where "t" is your producing time and "delta t" is your incremental shut-in time. Each of the pressure points is plotted in a straight line portion of the curve, is then extrapolated to infinite shut-in time which is equivalent to "t" over "delta t" plus 1 over 1. This gives the pressure to which the reservoir would build if you were able to leave the well shut-in for an infinite length of time. The slope of the build-up curve is also related to permeability through the equation shown below the curve on Exhibit 4. From the production data during the flowing period prior to shut-in, and the slope of

the build-up curve, we've calculated 331 millidarcy feet of permeability; and using the 74 feet of pay which we find in the Harris-Federal No. 1, gives an average permeability of 4.5 millidarcies.

Q What conclusions can you draw from the mere fact that you believe you have 4.5 millidarcies of permeability in this reservoir, Mr. Stokes?

A We feel that this permeability is adequate for gas production to drain more than 640 acres, particularly where you have a large section of pay. We feel that while this indicates the well can drain more than 640 acres, we have no production data to back this up. For that reason we are requesting temporary field rules at the present time. We feel that we can prove drainage when we have sufficient production data to base our calculations on.

Q Refer now to what has been marked Exhibit No. 5, Mr. Stokes, which appears to be an economic analysis on 160, 320, and 640-acre spacing in this pool.

A Item No. 1 on Exhibit 5 shows the cost and income data. We expect an income after royalty and taxes of $186.50 per million cubic feet of gas. This includes the condensate income. We show a well cost of $750,000. This well cost is the minimum that we anticipate. We've drilled two wells, one of which cost around $750,000, the other one cost $1,200,000. I believe the experience with the Devonian in this general area has been that the average well cost runs more than a million dollars.