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Rule 37 Case No. 0205817

APPLICATION OF SAMSON RESOURCES COMPANY FOR EXCEPTIONS TO STATEWIDE RULES 37 AND 38 TO DRILL ITS WELL NO. 2, L. L. JONES LEASE, ALLISON PARKS (U. MORROW) FIELD, HEMPHILL COUNTY, TEXAS

APPEARANCES:

REPRESENTING:

APPLICANT

Joe Christina (Attorney)
David Nelson (Attorney)
Stephen Knapp
Paul Clark
Rex Stout

Samson Resources

PROTESTANT

John Soule (Attorney)
Aaron Reyna
Tom Miller

Kerr McGee Corporation

PROCEDURAL HISTORY

Application Filed:	June 24, 1994
Notice of Hearing:	July 12, 1994
Hearing Held:	September 20, 1994
Transcript Received:	October 5, 1994
PFD Circulated	November 4, 1994
Heard by:	Jeffrey T. Pender, Hearings Examiner Margaret Allen, Technical Examiner

STATEMENT OF THE CASE

Samson Resources Company ("Samson") has applied to drill its Well No. 2 on the L. L. Jones Lease ("subject lease and well"), in the Allison Parks (U. Morrow) Field, Hemphill County, Texas. The proposed location is in the northwest quarter of the 640 acre lease, 467 feet from the west line and 1175 feet from the north line. Field rules require 467' lease line spacing, 3735' between-well spacing and 640 acre density. The well would need an exception to Rule 37 because it is 2938' from the L. L. Jones #1-14 which is the nearest well on the lease in the reservoir (see the attached plat 1). The proposed location is in the northwest quarter of section 14. All regular locations are located in the northeast quarter near the Beggert #1-13 which encountered extremely low permeability in the Upper Morrow (hereinafter "Puryear"). Samson maintains that a well at any regular location will encounter similar low permeabilities and not allow it to recover its share of hydrocarbons. Kerr-McGee, an offset operator, claims that the geology of the section is such that a well in the northeast quarter of the section will encounter sufficient porosity and permeability to allow the applicant to recover its share of hydrocarbons.

An exception to rule 38 is required because it would be the second well on the 640 acre lease. The protestant, Kerr-McGee, does not dispute that a Rule 38 exception is needed.

DISCUSSION

The controlling issue at this hearing was whether Samson could recover its share of hydrocarbons under the subject lease from a second well drilled at a regular location in the northeast corner of the block. Samson maintains that such a regular location would be too close to the Beggert #1-13 which encountered extremely low permeability (.013 millidarcies) and is expected to ultimately recover only 1 BCF.

The Puryear in the #1-13 is a chert conglomerate with a high kaolinite content. Kaolinite is a type of clay. The kaolinite or clay is responsible for the extremely low permeability. The clay preferentially occupies the pore space, reducing porosity and permeability. The E.T.S. Markham #1-8, about a mile to the south, is also a tight chert conglomerate in the subject reservoir with similar clay problems as the Beggert #1-13.

Samson's concern is that the closer you get to the Beggert #1-13, the greater the likelihood of encountering impermeable Puryear. To support its thesis, Samson points out the increasing rate of production as one moves west along structure from the Beggert #1-13 to the Bowers #2-257 about two miles to the northwest. The daily gas rate increases from 229 MCFD in the Beggert #1-13 to 401 MCFD in the Bowers #1-257 to 5939 MCFD in the

Bowers #2-257. They predict the rate of decrease in permeability from west to east to be relatively smooth and roughly proportional to the rate of decrease in the daily gas production rates from west to east. They propose no depositional or diagenetic model to explain the gradual decrease in permeability from west to east.

Kerr-McGee does not believe that permeability decreases gradually from west to east. They believe that the low permeability at the Beggert #1-13 and the E. T. S. Markham #1-8, both down-dip wells, is a localized phenomenon related to geochemical reactions occurring near the original gas-water contact. If low permeability is present only to the east of section 14, there is no reason that a well at a regular location cannot recover the reserves under section 14 that the existing well will not recover.

Kerr-McGee's theory is as follows. Shortly after the Allison Parks structure formed, gas started to fill the structure. The presence of gas in the pores of the updip portion of the field altered the chemical environment in the pores so that clay crystals could not form. Consequently, the pores in the updip portion of the structure remained open and clay-free. Clay could form only in the down dip portion of the structure below the gas-water contact in an oxidizing environment. The net result, according to Kerr-McGee, is a relatively sharp permeability change between the more open, gas-filled pores above the original gas-water contact and the clay-clogged pores below the contact. Mr. Reyna testified that there were documented examples of this phenomenon in Morrow fields to the south. This was not disputed by Samson.

Kerr-McGee presented a Puryear isopach relating the basic pressure data, core data and log data to its theory of clay diagenesis in a simple, cohesive and reasonable manner which does a good job of explaining the well results and pressure histories. The isopach predicts that the northern part of the field is effectively hydraulically separate from the southern part of the field (see Kerr-McGee Exhibit 4 and attached plat 2).

In the northern lobe, the three Bowers wells and the Kerr-McGee Kiker #2-15 are the producing wells. The Beggert #1-13 is near the original gas-water contact and is a poor producer. According to Kerr-McGee, if a well had been drilled to the southeast of the Beggert #1-13 it would penetrate the Puryear below the original gas-water contact and be tight.

In the southern lobe, the Kerr-McGee Kiker #1-13 and the L.L. Jones #1-13 are the producing wells. The ETS Kiker #1-6, the Kerr-McGee Kiker #1-6, the Kerr-McGee Beggert #1-7 and the ETS Markham #1-8 all penetrate the Puryear below the original gas-water contact and are tight.

In support of its theory of hydraulically separate lobes, Mr. Reyna, for Kerr-McGee, presented pressure surveys showing nearly identical bottom-hole pressures in the only two producing wells in the southern lobe (L. L. Jones #1-14: 4587 psig and Kiker #1-15: 4567 psig) compared to a significantly higher bottom-hole pressure of 6246 psig for the Bowers

#1-257 well in the northern lobe. Kerr-McGee's model of the reservoir, with hydraulically separate lobes, supports its contention that a regular location is not only feasible but preferable to Samson's proposed location. Kerr-McGee Exhibit #4 shows that at a regular location, Samson could get almost twice the net pay.

Kerr-McGee's northern and southern lobe model is inconsistent with Samson's hypothesis of field-wide pressure communication as purportedly demonstrated on Samson's Exhibit 15. The problem with Samson's Exhibit 15 is that, of the seven pressure histories plotted, six are for wells in the northern lobe of the field and only one pressure history is from a well in the southern lobe (the L. L. Jones #1-14). All the histories plotted for northern wells show a drop in pressure when the Kiker #2-15 (also a northern lobe well) was put on production in 1988 indicating pressure communication between these six wells. The one southern lobe well, the L.L. Jones #1-14, shows no interference from the Kiker #2-15 start up.

Samson estimates that there was 19.2 BCF original recoverable gas-in-place under the lease. The L.L. Jones #1-14 has recovered 3.8 BCF to date and will recover another 0.9 BCF for an ultimate recovery of 4.7 BCF. That would leave an estimated 14.5 BCF unrecovered if another location is not granted. Kerr-McGee estimates the original recoverable gas-in-place to be 12.5 BCF or about 2/3 that of Samson's estimate. Mr. Reyna further testified that about 8 BCF will remain unrecovered without another well. Both parties agree that a second well is necessary.

EXAMINERS' RECOMMENDATION

Kerr-McGee's permeability model is reasonable and is consistent with geochemical processes known to have been active in the formation of Morrow gas fields in the area. Its isopach is consistent with recorded pressure observations and other geologic data and supports drilling at a regular location. Samson does not offer any geologic theories to support its proposed model of gradual permeability change across the field. Further, its Exhibit 15 is misleading in that it purports to show similar pressure histories for wells throughout the field yet six out of the seven wells plotted are from the northern half of the field and only one well is from the south. That one well, the L.L. Jones #1-14, shows a different pressure history than the others.

The examiners believe that Kerr-McGee has presented a more reasonable explanation of the field data. This means that Samson can drill closer to the Beggert #1-13, at a regular location, with the likelihood more probable than not of encountering acceptable permeability in the Puryear. Such a location will afford Samson a reasonable opportunity to recover its share of hydrocarbons. Samson has not carried its burden to refute a regular location and is not entitled to an exception to Rule 37.

Both parties agree that a second well is necessary to recover the hydrocarbons under the lease. In the subject field it is very common to have two wells for every 640 acre lease. The examiners agree that Samson needs a second well to recover its share of hydrocarbons under the lease.

Examiners therefore recommend that Samson's application for an exception to Rule 37 be denied and that its application for an exception to Rule 38 be granted.

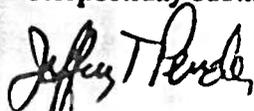
FINDINGS OF FACT

1. Notice of hearing was given by first class mail at least 10 days before the hearing to all designated operators, lessees of record for tracts that have no designated operator, and owners of record of unleased mineral interests for each adjacent tract and each tract within 467 feet of the proposed location.
2. Samson Resources Company has submitted a Form W-1, dated June 24, 1994 to drill its Well #2 on the 640 acre L.L. Jones Lease, Allison parks (U. Morrow) Field, Hemphill County, Texas.
3. Special field rules for the Allison Parks (U. Morrow) Field require 467 feet lease-line spacing, 3735 feet between-well spacing and 640 acre proration units.
4. The proposed well would be the second well on the 640 acre lease.
5. There are at least 8 BCF recoverable gas reserves that will not be recovered by the existing well on the lease.
6. There are regular locations on the subject lease.
7. Samson has not established that a second regularly located well would not enable it to recover its share of hydrocarbons underlying the tract.
 1. Kerr-McGee's theory of clay diagenesis and its isopach are reasonable and account for the basic log, core and pressure observations.
 2. Samson provided no theory or basis for linking the observed daily production rate gradient to a gradual lateral change in permeability.

CONCLUSIONS OF LAW

1. Proper notice of hearing was timely given to all persons legally entitled to notice.
2. All things have occurred and have been done to give the Commission jurisdiction to decide this matter.
3. Samson is not entitled to an exception to Statewide Rule 37 to prevent confiscation.
4. Samson is entitled to an exception to Statewide Rule 38 to prevent confiscation.

Respectfully submitted,



Jeffrey T. Pender
Hearings Examiner



Margaret Allen
Technical Examiner

JTP/kam