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* KEY ISSUES: Confiscation                                *
*             R37 location necessary even though regular *
*             location on tract                          *
*             R37 location reasonable due in large part  *
*             to negligible effect on offset             *
*                                                        *
* FINAL ORDER: R37 EXCEPTION APPROVED                     *
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RULE 37 CASE NO. 0206326

APPLICATION OF ENRON OIL & GAS COMPANY FOR A RULE 37 EXCEPTION TO DRILL WELL NO. 12, JONES 97 LEASE, SAWYER (CANYON) FIELD, SUTTON COUNTY, TEXAS

APPEARANCES:

FOR APPLICANT:	**APPLICANT:**
Flip Whitworth (attorney) James Clayton Johnny Jordan	Enron Oil & Gas Company
FOR PROTESTANT:	**PROTESTANTS:**
Lloyd Muennink (attorney) David Dennard Sarah G. Stanley	American Exploration Company

PROPOSAL FOR DECISION

PROCEDURAL HISTORY

APPLICATION FILED:	August 16, 1994
NOTICE OF HEARING:	October 27, 1994
HEARING DATE:	January 11, 1995
TRANSCRIPT RECEIVED:	January 25, 1995
HEARD BY:	Meredith Kawaguchi, Legal Examiner Doug Johnson, P.E., Technical Examiner
PFD CIRCULATION DATE:	September 19, 1995
CURRENT STATUS:	Protested

STATEMENT OF THE CASE

Enron Oil & Gas Company ("Enron") proposes to drill the tenth gas well on its 542 acre Jones 97 Lease in Sutton County, Texas. Field rules in the target Sawyer (Canyon) Field require 500 feet spacing from lease lines, 1,000 feet between wells on the same lease, and a 320 acre drilling unit with a 40 acre option. The proposed well is 350 feet from Enron's west lease line, 478 feet from its south lease line, and 962 feet from the nearest well on its Jones 97 Lease. Hence, the company has requested a Rule 37 exception. American Exploration Company ("American") operates leases that directly offset to the east, south, and north the Jones 97 Lease. American opposes Enron's application for a Rule 37 exception for the proposed Jones 97 Well No. 12.

DISCUSSION OF THE EVIDENCE

Regular and Irregular Locations

All parties agree there are significant reserves under the Jones 97 Lease that will not be recovered by existing wells on the lease, anywhere from approximately 13 billion cubic feet (bcf), according to Enron, to approximately 6 bcf, according to American.

Enron's witness testified that an irregular location in the southwest portion of its tract is necessary to penetrate the subject field in an area where the net sand is thicker, and where wells' estimated ultimate recoveries, based on decline curve analyses, will allow Enron a reasonable opportunity to recover the maximum amount of remaining, recoverable reserves under its lease, thereby preventing confiscation.

There are regular locations in the northeastern area of the tract. According to Enron's estimated ultimate recovery (EUR) map, any well at a regular location in the northeastern area will recover no more than .25 bcf, and more likely .2 bcf. According to Enron's net sand isopach, the thickness of the reservoir decreases considerably in the eastern portion of the tract as opposed to the western side. Enron expects a well at the proposed Rule 37 location to recover .375 bcf. American is of the opinion that Enron's expectation of potential recovery from Well No. 12 is inflated, because American estimates less net pay than Enron estimates at the proposed location, and because American believes substantial depletion of the area has occurred. American did not provide any estimate of the amount it expects the proposed well to recover.

The examiners believe Enron carried its burden to prove that an irregular location in the southwestern portion of its tract is necessary to give Enron a reasonable opportunity to recover the maximum amount of remaining, recoverable reserves under its lease. In the southwest portion of the lease there are several Rule 37 locations that were discussed at the hearing. The question becomes, which Rule 37 location is the most reasonable?

Enron's choice is a location 350 feet from the west line and 478 feet from the south line of the lease. American's choice is a location 500 feet from the west line, and either 500 feet or 1200 feet from the south line. Enron initially preferred these latter locations, because the net pay and the EURs increase toward the western middle of the tract. There is, however, a powerline that runs parallel to and 500 feet within the tract's western border. In addition, the location costs are $70,000 at the 500 feet/500 feet location and $110,000 at the 500 feet/1200 feet location. Location costs at the proposed site (350 feet/478 feet) are $30,000.

The examiners are of the opinion that Enron's proposed location 350 feet from the west line and 478 feet from the south line is reasonable, because Enron's evidence demonstrates that the proposed well will have an insignificant effect on American's offsetting reserves and will cost Enron anywhere from $40,000 to $80,000 less than either of the other two Rule 37 locations, both of which are undesirable due to the existence of the powerline. American's representative questioned whether Enron could move its location 125 feet to 150 feet beyond the powerline at the 1200 feet location, where there is an apparent mesa on the topographical map. Enron's witness testified that while the area looks flat on the map, it is strewn with large boulders which would require blasting, and that location costs in that area run in excess of $100,000.

Effect on American's Acreage

The parties agree that the Sawyer (Canyon) Field is a complex reservoir. Sands are extremely heterogenous and compartmentalized. The field has been designated as tight, with permeabilities of less than .1 millidarcies. Wells drilled into the Sawyer (Canyon) Field encounter virgin-pressured sands and sands that have been depleted by offset wells. Because the sands are tight, long pressure build-ups in wells are required to obtain accurate bottomhole pressures. Complicating the effort to obtain accurate pressures is the cross-flow among the various sands; gas in the higher pressured sands flows into the lower pressured sands, which allows the lower pressures to dominate a pressure test.

American's engineering witness testified that newer wells in this area of field come on-line with lower pressures than do older wells (1970s vintage), indicating depletion and drainage around the newer wells. The lower pressure in newer wells demonstrated, according to the protestant, that older wells drain at least as far as 1,000 feet. American measured the pressure in these newer wells after a 24 hour shut-in. All witnesses agreed that in this tight sand an accurate pressure cannot be obtained after 24 hours. After a period of three weeks the bottomhole pressure in a representative well in this field was only 65% of the fully built-up pressure. The witnesses agreed that to get a fully built-up pressure in this field, the well must be shut-in several weeks to a couple of months. American's witness believed, however, that because newer wells are producing 1/3 to 1/2 as much as older wells, the 24 hour build-up pressures are mostly correct. American estimated that the pressure at the proposed location will be approximately 1200 psi. Virgin pressure in the field averages 1,960 psi.

Enron estimated that the pressure at the proposed location will be approximately 1600 psi.

Enron acknowledges that some depletion has occurred so the pressure will not be 1,960 psi, but will exceed a 24 hour shut-in pressure of 1,200 psi.

Although drainage probably will be elliptical, both parties calculated drainage circles for the proposed well. Using American's estimate of net pay (331 feet) and American's suggested pressure of 1,250 psi, the proposed well will drain a radius of 344 feet. Using Enron's estimate of net pay (380 feet) and a pressure of 1500 psi, the well will drain a radius of 398 feet. American calculated the percentage of its acreage that would be affected if the well drained a radius of 500 feet; the area affected would be 9.96% of American's acreage. Consequently, a well that drained a radius ranging from 344 feet to 398 feet likely would have a negligible effect on American's acreage.

In addition, if drainage is elliptical, which is probable, the well will drain in a northeast/southwest direction, making it even less likely that American's acreage will be affected. Enron's witness testified that its frac half-length design is 500 feet which means the actual frac half-length will be 350 feet, or less, keeping the frac well within Enron's boundary. Further, the frac orientation is north 40 degrees east. If the frac follows this orientation, the parties agreed it would have to traverse a distance of 545 feet to cross American's lease line.

OPINION AND RECOMMENDATION

The examiners are of the opinion that Enron's proposed location is a reasonable location among other potential Rule 37 locations on the Jones Lease. This location provides Enron with a reasonable opportunity to recover .375 bcf of the 6 bcf or so gas remaining under its tract. This location will not have a significant effect on American's reserves, due to the compartmentalized nature of the sands, the tightness of the reservoir, the depletion that has already occurred, the length of the frac design, and the frac orientation in this area.

Enron failed to prove that its proposed location is necessary to prevent waste. Witnesses for both parties testified that the discontinuity of pay sand is a field-wide condition. If substantial quantities of gas are in these sands, the remedy is a field rule amendment to reduce the required well density. Enron presented no unusual condition under the Jones Lease that indicated reserves would be wasted regardless of the density of drilling allowed.

The examiners recommend that Enron's application be granted to prevent confiscation.

FINDINGS OF FACT

1. At least ten day's notice of this hearing was given to the designated operator, all lessees of record for tracts that have no designated operator, and all owners of unleased mineral interests for each tract adjacent to the Jones 97 Lease and each tract nearer to the well than the prescribed minimum lease line spacing distance.

2. The application for a Rule 37 exception was filed properly by Enron Oil & Gas Company (the applicant) on form W-1 (Application to Drill, Deepen, Plug Back or Re-enter).

3. The applicant seeks an exception to Statewide rule 37 to drill Well No. 12, the tenth well on the 541.7 acre Jones 97 Lease.

4. The applicant proposes to complete the well in the Sawyer (Canyon) Field at a depth of 6,500 feet. Field rules require the well to be 500 feet from the nearest lease line, 1,000 feet from the nearest well on the lease, with a drilling unit of 320 acres and a 40 acre option.

5. The proposed well is 350 feet from the nearest lease line and 962 feet from the nearest well on the lease.

6. Offset operator, American Exploration Company protested the application.

7. The Sawyer (Canyon) Field is a complex reservoir.

    a. Sands are discontinuous and may be isolated vertically as well as horizontally.

    b. Wells encounter both depleted sands and virgin-pressured sands.

    c. The sands are heavily laminated with shale.

    d. Porosities vary from less than 5% to 12%.

    e. Water saturations vary from 30% to more than 50%.

8. The average initial bottom hole pressure of wells in the field is 1,960 psi.

9. Due to the tightness of the reservoir sands (.1 millidarcies) a well must be shut in more than three weeks to obtain an accurate bottom-hole pressure.

10. There are recoverable reserves under the Jones 97 Lease that will not be recovered by existing wells on the lease, in a range of 6 billion cubic feet (bcf) to 13 bcf.

11. The regular locations in the northeastern portion of the lease will allow Enron to recover substantially less of the remaining, recoverable reserves under its tract than will a well at an irregular location in the southwestern portion of the tract.

    a. The estimated ultimate recoveries of wells in the northeast area are expected to be .25 bcf or less, based on decline curve analyses of existing wells nearest this area.

    b. The net pay in the northeastern portion of the tract is considerably less than the net pay in the southwestern portion.

    c. A well at the proposed location in the southwestern portion is expected to recover .375 bcf.

12. A well at the proposed location (350 feet from the west line and 478 feet from the south line) will not affect significantly American Exploration Company's offset tracts.

    a. Based on American's estimate of net pay, 331 feet, and a bottom hole pressure of 1,250 psi, the proposed well will drain a radius of 344 feet.

    b. Based on Enron's estimate of net pay, 380 feet, and a bottomhole pressure of 1500 psi, the proposed well will drain a radius of 398 feet.

    c. The portion of American's acreage that would be affected by a well draining a radius of 500 feet is 9.96%.

    d. Based on a study by Gas Research Institute, the fracture orientation in this area of the field is north 40 degrees east. Because of this orientation, a fracture would have to traverse a distance of 545 feet to cross American's lease line.

    e. In this field a frac design of 750 feet achieves only 400 to 500 feet of length. Enron's frac design is 500 feet, which would achieve a length of approximately 350 feet.

13. Enron did not present any evidence of unique reservoir conditions underlying the Jones 97 Lease.

CONCLUSIONS OF LAW

1. Proper notice of hearing was timely issued by the Railroad Commission to appropriate persons legally entitled to notice.

2. All things necessary to the Commission attaining jurisdiction over the subject matter and the parties in this hearing have been performed.
3. The applicant did not carry its burden to prove that the requested Rule 37 exception is

necessary to prevent waste.

4. The requested Rule 37 exception is necessary to provide Enron with a reasonable opportunity to recover its share of hydrocarbons from beneath its Jones 97 Lease, thereby preventing confiscation.

5. The proposed location is reasonable.

Respectfully submitted,

Meredith Kawaguchi
Legal Examiner

Doug Johnson, P.E.
Technical Examiner

MFK/das/bjw