
**APPLICATION OF HILCORP ENERGY COMPANY TO CONSIDER AN EXCEPTION TO STATEWIDE
RULE 37 TO DRILL THE PROPOSED WILLIAM C. COCKE (12988) LEASE, WELL NO. 3 IN THE
SEVEN SISTERS, E. (LOMA NOVIA) FIELD, IN DUVAL COUNTY, TEXAS**

APPEARANCES:

APPLICANT -

Ana Maria Marsland-Griffith, Attorney
Jeff Edgar, Petroleum Engineer

REPRESENTING -

Hilcorp Energy Co.
Hilcorp Energy Co.

PROTESTANT -

Georgia Vandervoort

Vortt Exploration Co., Inc.

PROCEDURAL HISTORY

Application Filed:	May 9, 2002
Notice of Hearing:	June 28, 2002
Hearing Held:	August 15, 2002
PFD Circulated:	October 25, 2002
Heard by:	Scott Petry, Hearings Examiner Thomas Richter, PE, Technical Examiner

STATEMENT OF THE CASE

Hilcorp Energy Company ("Hilcorp" or "applicant") seeks an exception to Statewide Rule 37 to drill its William C. Cocke Well No. 3 ("subject well") in Duval County, Texas. The application is for the Seven Sisters, E. (Loma Novia) Field ("subject field") and seeks a lease line and between well spacing exception. The applied-for field is subject to field rules requiring 467 feet minimum spacing to the nearest lease line and 1200 feet minimum between well spacing.

The William C. Cocke (12988) Lease ("subject lease") is comprised of 89.3 acres as outlined on the plat attached to the Form W-1 (Application for Permit to Drill, Deepen, Plug Back, or Re-enter) submitted by Hilcorp on May 9, 2002 (*See Appendix 1*). The subject well is only 588.8 feet from another well completed in the subject field on applicant's lease and requires an exception to the minimum between well spacing requirement. In addition, the subject well requires a lease line exception, as it is approximately 299 feet from its eastern lease line. Hilcorp is its own offset operator to the east of the subject well.

Hilcorp claims that an exception is necessary to prevent waste and promote conservation of resources. In arguing that it was entitled to a Rule 37 exception, Hilcorp stated that an "attic" reservoir exists on its unit and that, without a well at the proposed location, the reserves would go unrecovered. While the applicant is its own offset operator to the east and has "waived" any objection to the lease line spacing rule, a Rule 37 exception for both the lease line and between well spacing provisions is necessary. Applicant's case regarding waste and the attic reservoir, however, is equally applicable to both the lease line and between well spacing provisions of the Rule 37 exception.

Hilcorp's application is protested by Ms. Georgia Vandervoort for the protestant, Vortt Exploration Co. ("Vortt" or "protestant"). Vortt is the operator of the tract to the west of Hilcorp's subject lease.

BACKGROUND

The subject field was discovered on October 1, 2000 at a depth of 2,808 feet. Hilcorp is the only operator in the field and operates two leases, the Cocke Lease and the Cantu Lease. The Cantu Lease is 299 feet to the east of the proposed location. Each of applicant's leases currently has one producing well in the subject field. The proposed well's location is 648.9 feet from the nearest lease line of protestant's mineral estate.

DISCUSSION OF THE EVIDENCE

I. Applicant's Evidence

Hilcorp argued that the subject field consists of a meandering channel deposit that contains a stratigraphic trap that trends to the east. The applicant's main contention is that the layout of this deposit and past experience in the field has shown that an "attic," or updip reservoir, exists and that, absent the exception being granted for the subject well, the reserves in this trap will not be recovered by either existing wells or other wells drilled at regular locations. Additionally, the applicant argued that past experience has shown that this exception is necessary because Hilcorp has already drilled a "dry hole" in the subject field at a regular location and that this well, the Farmers Life Unit (FLU) 1-5 Well, completely missed the channel deposit.¹

The applicant provided uncontested engineering testimony that the subject field is a water drive reservoir with an aquifer influx. This requires that the location of the subject well be updip of any currently producing wells, while remaining within the boundary limits of the sand channel, to recover the reserves that the existing wells will not recover. In support of this, the applicant's petroleum engineer presented testimony and well control exhibits that confirm that the subject field is indeed a channel type deposition. The well control exhibits that were submitted into the record included logs and core analyses for the wells immediately surrounding the proposed subject well.

One of these wells, the Cocke No. 1 Well, was completed in October 2000 and is 588.8 feet from the proposed well location. The Cocke No. 1 encountered approximately seven feet of net pay² and has cumulative production of 96,650 barrels of oil and 29.6 million cubic feet of natural gas. The well produced essentially water free until October 2001 when water production increased dramatically over a period of several months. The current producing rate is 158 barrels of oil per day, 44 mcf per day, and 99 barrels of water per day. The second well in the subject field, the Cantu No. 2 Well, was completed in January 2002 and has cumulative production of 17,490 barrels of oil and 4.06 million cubic feet of gas. The well has approximately two feet of net pay. Water production for the Cantu No. 2 Well increased dramatically in the first few months of production and its current producing rate is 51 barrels of oil per day, 20 mcf per day, and 264 barrels of water per day.

¹ The FLU 1-5 Well was subsequently completed in a different field, but the subsequent completion in a gas field is not relevant to the question of waste in the subject field.

² Net pay is based on neutron density convergence and resistivity greater than 2.5 ohms.

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The Cantu No. 2 Well, which is to the east-northeast of the proposed location, is on the same structural contour as the Cocke No. 1 Well, which is to the southeast of the proposed location (*See Appendix 2*). For a successful completion in the channel sand, Applicant argued that well log analyses would have to show neutron density convergence and resistivity greater than 2.5 ohms. The logs for both the Cocke No. 1 Well and the Cantu No. 2 Well showed a resistivity of greater than 2.5 ohms, but the log for the FLU 1-5 Well showed only 2.5 ohms of resistivity in the middle of the three lobes indicating sand presence.

The FLU 1-5 Well was drilled approximately 1,200 feet to the north-northwest of the producing Cocke No. 1 Well and, according to the exhibits, was drilled updip from the Cocke No. 1 Well. The FLU 1-5 well was drilled at a location that complied with the between well spacing provisions of the field rules, but the attempt to complete the well showed no fluid flow, even after the formation was stimulated with acid. Hilcorp's attempt to complete this well proved to be unsuccessful and the well was a "dry hole" in the subject field.

Other evidence put forth by Hilcorp included sidewall core analyses for the area wells. The core analysis for the FLU 1-5 Well showed the formation to be "tight". The core analyses performed on the FLU 1-5, Cocke No. 1 and Cantu No. 2 correspond to the well logs and confirm a southwest-northeast trending channel deposit. The proposed Cocke No. 3 Well would be located approximately half way between the productive Cocke No. 1 and the Farmers Life Unit 1-5 Well, which was shown to be unproductive in the subject field. The applicant argued that the proposed location should be in the target channel sand but should be approximately 8 to 9 feet updip of the Cocke Well No. 1 to hit the target reserves. Hilcorp's argument that drilling at a regular between well location would result in the interval being tight and outside of the channel is primarily based on the log analyses and core data. Allowing the placement of the well 588.8 feet from the Cocke Well No. 1, however, would allow the applicant to "...back into the channel...."

The applicant further asserted that, because the drive mechanism is a water drive with an aquifer influx,³ being high on the structure is critical and that applicant's proposed location is necessary to reach reserves that will otherwise go unrecovered. Hilcorp anticipates that the proposed location will encounter at least 6 feet of net pay and estimates that there are approximately 108,000 barrels of recoverable oil within this updip portion of the reservoir underlying the subject lease.⁴

³ The expected recovery efficiency for a water drive reservoir in this case is 40%.

⁴ The estimated recoverable reserves are based on 40 acres drainage area and 6 feet of net pay.

II. Protestant's Evidence

Vortt's assertion was that, if the exception to Statewide Rule 37 was granted, the production from the subject well would damage its unleased mineral interest. The protestant further argued that there are other reasonable regular locations that Hilcorp could designate for its subject well that would protect Vortt's correlative rights. During Vortt's cross-examination of Hilcorp's petroleum engineer, it was acknowledged that there is a small swathe of land on the subject lease where a well could be drilled at a location that is regular to both lease lines and between well spacing provisions.

The regular location that Vortt requests, however, would actually be *closer* to the Vortt Tract than the proposed location, which is approximately 649 feet from the Vortt Tract. Nevertheless, the protestant argued that Hilcorp was attempting to condemn the possibility of recoverable hydrocarbons on the Vortt tract. Additionally, the protestant argued that the applicant failed to perform a reservoir study of the possible reserves that may underlie Vortt's adjacent tract.

EXAMINERS' OPINION

The applicant has requested an exception to Statewide Rule 37 for its proposed William C. Cocke No. 3 Well in the Seven Sisters, East (Loma Novia) Field and has based its requested exception on the doctrine of waste. An applicant seeking an exception to Rule 37 based on waste must establish: 1) that unusual conditions, different from conditions in adjacent parts of the field, exist under the tract for which the exception is sought; 2) that, as a result of these conditions, hydrocarbons will be recovered by the well for which a permit is sought that would not be recovered by any existing well or by additional wells drilled at regular locations; and, 3) that the volume of otherwise unrecoverable hydrocarbons is substantial. Hawkins v. Texas Co., 209 S.W. 2d 338, 343-44 (Tex. 1948). The evidence submitted by the applicant meets all three of the prerequisites necessary for a waste case and the application should be granted.

A. UNUSUAL CONDITIONS

Hilcorp has established the first prerequisite in that it has shown there is an unusual condition in the subject field. More specifically, the applicant has shown that the meandering channel deposit underlying its lease contains a stratigraphic trap that trends to the east. Put another way, the applicant has shown that the structure of the channel deposit is such that an "attic" exists and that this updip portion of the reservoir cannot be drained by the two existing wells in the field. Applicant has shown that its two producing wells (the Cocke No. 1 and Cantu No. 2) are down dip in the

channel and that, due to water incursion, the reserves updip in the reservoir will not be recovered by any existing well.

The applicant's geological and engineering evidence supports the assertion that the meandering channel has within it reserves trapped by the sand structure and water influx. The engineering evidence, including the bottom hole pressure readings, clearly depicts an efficient and effective water drive reservoir, where being high on structure is critical to recovering reserves that will not be recovered by the existing wells. Furthermore, the examiners note that the technical data and the configuration of the stratigraphic trap support the drainage pattern sponsored by the applicant. (*See Appendix 2*).

B. RECOVERY BY OTHER WELLS

The second element of the three part waste test is establishing that an existing well or a well at a regular location would not recover the same hydrocarbons which an applicant claims would be recovered at the exception location. In determining whether there is an "ultimate loss of oil"⁵ or other hydrocarbons, it should be noted that there is no ultimate loss of hydrocarbons if the reserves in question could be recovered from a well at a regular location or by other wells, whether those wells be *on or off* of the subject tract. The applicant in this docket has shown that no other surrounding well is capable of recovering these reserves and that a well drilled at a regular location, whether on or off the subject lease, would "miss" the target reserves.

In a water drive reservoir, it is necessary that a well be located at the highest location on the structure and remain in the quality channel sand for a successful opportunity to recover the updip reserves. The applicant has shown that a structurally higher location will allow the proposed well to recover updip reserves that would not be recovered by existing wells.

With regard to the locations available on Hilcorp's subject lease, the applicant has clearly shown that drilling at a regular location will result in another well that is "tight and out of the channel". More specifically, the evidence, including core analyses and the technical data for the FLU 1-5 Well, shows that a regular location would be "extremely close to [applicant's] well that was tested tight." The FLU 1-5 Well, which was unproductive in the subject field, was drilled at a regular location 1,200 feet from the Cocke No. 1 and proved that a regular between well location would be outside the productive Loma Novia channel sand limits and would likely miss the channel in its entirety.

⁵ Gulf Land Co. v. Atlantic Refining Co., 131 SW2d 73 (Tex. 1939).

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The evidence also shows that a regular location is *not* available on the *protestant's* tract as well. Vortt's tract is a long, narrow eighty-six acre tract which is configured in such a way that a well could not be drilled at a regular location in the subject field. Additionally, the evidence regarding recoverable reserves⁶ has shown that the drainage area of the subject well would not extend onto the protestant's tract (*See Appendix 2*). Therefore, the evidence shows that the reserves in question could not be recovered by a regularly located well on the protestant's tract.

Absent applicant's requested exception, an additional well at a regular location on the subject lease will not be able to recover these reserves. Further, the protestant's tract has no regular locations and the existing wells will not recover the reserves trapped in the updip portion of the reservoir. Therefore, the applicant has satisfied the second element of the three part waste test.

C. SUBSTANTIAL VOLUME

The third and final prerequisite is that the applicant must show that a substantial volume of hydrocarbons is otherwise unrecoverable. Hilcorp's evidence and testimony indicate that, absent an exception, 108,000 barrels of oil will go unrecovered by the applicant or by any other offsetting party due to the structural configuration of the reservoir. The amount of reserves underlying the applicant's tract qualifies as "substantial" and these reserves would not be recoverable but for the granting of the requested exception to Statewide Rule 37.

Therefore, the examiners recommend that Hilcorp's application to drill the well be approved in order to prevent the waste of hydrocarbons and recommend that the following proposed findings of fact and conclusions of law be adopted:

FINDINGS OF FACT

1. At least 10 days 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 record of unleased mineral interests for each affected adjacent tract. Counsel and witnesses appeared on behalf of Hilcorp Energy Corporation ("Hilcorp" or "applicant") and presented evidence. Vortt Exploration ("Vortt" or "protestant"), an offset mineral interest owner to the west of the proposed well location, appeared and protested the application.

⁶ The estimated recoverable reserves are based on 40 acres drainage area and 6 feet of net pay.

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2. Hilcorp seeks an exception to Statewide Rule 37 to drill Well No. 3 on its William C. Cocke (12988) Lease in the Seven Sisters, E. (Loma Novia) Field ("subject field"). Applicant proposes to drill the well at a location which is 299 feet from the eastern lease line and 1194.9 feet from the southeastern lease line. The proposed location is also 588.8 feet from the existing Cocke No. 1 Well to the southeast of the proposed location.
3. The protestant's unleased mineral estate is located to the west of the subject lease at a distance of approximately 648.9 feet from the proposed well location. The applicant's proposed well location exceeds the regular minimum lease line well spacing to the protestant's mineral estate.
4. The subject field is governed by statewide rules requiring lease line spacing of 467 feet and between well spacing of 1200 feet. The field rules further specify a density pattern of 40 acres per well.
5. Applicant's William C. Cocke (12988) Lease is an irregularly shaped tract containing 89.3 acres.
6. The protestant's tract is a long, narrow eighty-six acre tract on which there is no regular location in the subject field.
7. The Seven Sisters, E. (Loma Novia) Field was discovered on October 1, 2000 at a depth of 2,808 feet subsurface depth. Applicant is the only operator in the subject field and maintains two leases (the Cocke Lease and the Cantu Lease), each of which has one producing well in the subject field.
8. The sand of the Seven Sisters, E. (Loma Novia) Field is a meandering channel deposit with a stratigraphic trap that trends to the east. Well control confirms a southwest-northeast trending channel deposition.
10. The applicant's Farmers Life Unit (FLU) 1-5 Well was drilled at a regular location approximately 1,200 feet north-northwest and updip to applicant's Cocke No. 1 Well. The completion attempt in the subject field was unsuccessful.
11. Bottomhole pressure information conclusively shows that the drive mechanism of the field is an efficient and effective water drive with an aquifer influx.
 - a. Static bottomhole pressure (BHP) tests were performed on the Cocke No. 1 Well.
 - b. In February 2001, four months after the Cocke No. 1 Well was placed on production, the BHP was 889.5 psia. In July 2001, the Cocke No. 1 Well had produced 27,000

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barrels of oil and no water, and the BHP was 832 psia.

12. The proposed well would recover an additional 108,000 barrels of oil from the updip reservoir which would otherwise go unrecovered.

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 water drive mechanism of the subject field and the structural limits of the channel sand constitute an unusual condition that is different from conditions in adjacent parts of the field under the applicant's lease.
4. No existing well or well drilled at a regular location, either on the subject lease or on an offsetting tract, could recover the hydrocarbons in the stratigraphic trap underlying the applicant's lease in the Seven Sisters, E. (Loma Novia) Field.
5. The estimated ultimate recovery of 108,000 barrels of oil at the applied-for location constitutes a substantial amount of hydrocarbons.
6. An exception to Statewide Rule 37 for a well at the applied-for location is necessary to prevent waste in the Seven Sisters, E. (Loma Novia) Field.

RECOMMENDATION

The examiners recommend that the subject application be granted in accordance with the attached final order.

Respectfully submitted,

Scott Petry
Hearings Examiner

Thomas Richter, PE
Technical Examiner

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