RULE 37 CASE NO. 0236671
District 04

APPLICATION OF CAMDEN RESOURCES, INC., FOR AN EXCEPTION TO STATEWIDE RULE 37 FOR THE CASAS LEASE, WELL NO. 1, ROSITA, E. (WILCOX CONS.) FIELD, DUVAL COUNTY, TEXAS

APPEARANCES:

FOR APPLICANT:	**APPLICANT:**
William Osborn Rick Johnston Bryant H. Patton Preston Moore Marc Rhoades	Camden Resources, Inc.

FOR PROTESTANT SWEPI L.P.:	**FOR PROTESTANT KLT GAS, INC.:**
Brian Sullivan Sandra Bolz Buch Lisa Chavarria Marc H. Stone Robert Hilty Ricardo E. Garza Kenneth Gray	Frank Honea Terry Payne Eric Carter

PROPOSAL FOR DECISION

PROCEDURAL HISTORY

APPLICATION FILED:	October 14, 2003
HEARING DATES:	May 11-14, 2004
HEARD BY:	James M. Doherty, Hearings Examiner Donna Chandler, Technical Examiner

DATE FOR CLOSING STATEMENTS: June 16, 2004
PFD CIRCULATION DATE: August 24, 2004

STATEMENT OF THE CASE

Camden Resources, Inc. ("Camden") drilled and completed the Casas No. 1 well in the Rosita, E. (Wilcox Cons.) Field, Duval County, Texas, on April 2, 2001. The well was permitted at a regular location 475' from the west line ("FWL") and 473' from the east line ("FEL") of the 81-acre Casas Lease. On August 6, 2003, in Cause No. DC-00-344, *Arnoldo Casas Et Al. v. SWEPI L.P. and Shell Western E & P, Inc.*, the Judge of the 229th District Court in Duval County, Texas, ordered that SWEPI L.P. ("SWEPI") be permitted to run a directional survey on the Casas No. 1. Thereafter, two directional surveys were run on the Casas No. 1, one on behalf of Camden on August 21, 2003, and another on behalf of SWEPI on September 4, 2003. As per the directional survey run on behalf of Camden, the bottomhole location of the Casas No. 1 was determined to be 80' FWL and 390' FNL of the Casas Lease. Field rules for the Rosita, E. (Wilcox Cons.) Field provide for 467' lease line and 933' between well spacing.

On September 30, 2003, the Commission's Permit Coordinator issued a letter to Camden requiring that Camden file an amended Form W-1 and obtain a Rule 37 exception for the as-drilled bottomhole location of the Casas No. 1. Camden complied by filing an amended Form W-1 seeking a Rule 37 exception on October 14, 2003. A plat submitted with the Form W-1, showing the location of the Casas No. 1, is attached to this proposal for decision as Appendix 1. On January 9, 2004, Camden filed a letter requesting that: (1) the hearing on the application for a Rule 37 exception be abated; and (2) the Commission convene a hearing pursuant to Statewide Rule 11(c)(1)(A) to determine whether the as-drilled bottomhole location of the Casas No. 1 is at a "reasonable" location such that a Rule 37 exception is not required. The request to abate the hearing on Camden's Rule 37 application was denied by the examiner's letter ruling dated January 23, 2004, but a new notice was issued broadening the call of the hearing on the application to include consideration of the issue of whether the bottomhole or completion locations of the Casas No. 1 are reasonable and whether the well requires a new permit pursuant to Statewide Rule 11.

The Camden application is protested by SWEPI, the operator, as here pertinent, of tracts offsetting the Casas Lease to the west and north, and by KLT Gas, Inc. ("KLT"), a non-operating working interest partner of SWEPI in the offsetting tracts.

POSITIONS OF THE PARTIES

(a) Camden Resources, Inc.

Camden's first position is that this Rule 37 case is an impermissible collateral attack on the Commission's 2002 final orders in Docket Nos. 04-0229075 and 04-0229076, in particular the Commission's conclusion in the final orders that the Casas No. 1 was drilled in compliance with Statewide

Rules 11 and 37. Camden asserts that no facts have changed that would warrant a different conclusion now.

Camden's second position is that the Casas No. 1 was drilled as nearly vertical as possible by normal, prudent, practical drilling operations and that the as-drilled bottomhole and completion locations of the well are "reasonable" within the meaning of Statewide Rule 11(c)(1)(A). Camden asserts that under Statewide Rule 11, a new permit is required for the as-drilled bottomhole location of the well only if it is established that the bottomhole or completion location is *not* a reasonable location, and that SWEPI has the burden of proof on this issue.

Alternatively, Camden argues that if it is determined that the as-drilled bottomhole location of the Casas No. 1 requires a new permit, a Rule 37 exception for the well is necessary to prevent waste and confiscation.

Camden also suggests that even if it should be concluded that a well at a regular location on the Casas Lease would be sufficiently productive to prevent waste and protect correlative rights, Camden nonetheless is entitled to a Rule 37 exception pursuant to Rule 37(m)(6), which Camden asserts does not require proof of either waste or confiscation.

(b) SWEPI L.P.

SWEPI disputes Camden's position that the Commission's prior final orders in Docket Nos. 04-0229075 and 04-0229076 predetermined any of the issues involved in this Rule 37 case or that this Rule 37 case constitutes a collateral attack on the prior final orders.

SWEPI argues that the Casas No. 1 was *not* drilled as nearly vertical as possible by normal, prudent, practical drilling operations as required by Statewide Rule 11. SWEPI says that the evidence shows that at a time when Camden knew the Casas No. 1 was drifting toward SWEPI's lease line, Camden continued to employ drilling practices calculated to hold the same angle and direction and took no steps to steer or influence the wellbore back beneath the surface location. It is SWEPI's position that the bottomhole location of the well, which drifted about 75% of the distance between the surface location and SWEPI's lease line, is not reasonable, and the well requires a Rule 37 exception. SWEPI further contends that a Rule 37 exception for the Casas No. 1 is not necessary to prevent waste or confiscation.

SWEPI disputes Camden's position that Camden is entitled to a Rule 37 exception pursuant to Rule 37(m)(6), contending that Rule 37(m)(6) requires a showing of reasonableness of a deviated wellbore, which Camden has not demonstrated.

(c) KLT Gas, Inc.

KLT adopts and supports SWEPI's position. It argues that Camden's actions constituted an intentional deviation of the Casas No. 1 toward the SWEPI/KLT lease line. KLT requests that the Commission find that the bottomhole location of the Casas No. 1 is not reasonable, that the well was drilled without the required Rule 37 exception permit, and that the well should be shut-in.

DISCUSSION OF THE EVIDENCE

Camden Resources, Inc.

(a) The Rule 11 Issues

Camden's President

As a part of its investigation of the Casas Lease, Camden examined a subsurface structure map acquired from the seller, which showed a proposed location on the lease that was structurally higher than SWEPI's offsetting wells in the Rosita, E. (Wilcox Cons.) Field. Also, Camden purchased and analyzed publicly available 3-D seismic for the area. Camden acquired the Casas Lease in December 2000, and spudded the Casas No. 1 during the third week of January 2001.

Prior to drilling the Casas No. 1, Camden obtained from service companies mud recaps for SWEPI's offsetting wells and used them to make decisions about mud weight, bit selection, and where casing should be set. In drilling the well, Camden used a packed bottomhole assembly from surface to total depth ("TD"), which Camden believes was calculated to drill the "straightest hole".

After the Casas No. 1 had been partially drilled, Camden decided to run a partial directional survey. According to Camden's President, this decision was made to determine the location of the well in relation to a fault shown on a time structure map prepared from 3-D seismic. In a previous deposition, Camden's President said the partial directional survey was run because deviations shown by inclination surveys were getting higher than Camden wanted. The partial directional survey was run from 9,050' down to 12,550' and showed that from about 9,400' to 12,550', which was TD at the time the partial directional survey was run, the well had drifted 114' to the west and 77' to the north.

At this point, Camden contacted an oil and gas consulting firm to inquire about Commission policy on directional surveys. Camden understood from this contact that Commission staff took the position that if a well reaches TD and a "top to bottom" directional survey is run showing that the well has drifted closer to the lease line than permitted by the applicable spacing rule, a Rule 37 exception permit is required. The consultant's report did not concern Camden because of Camden's understanding that under Statewide Rule 11, if inclination surveys showed the Casas No. 1 was on the Casas Lease at TD, the well was "in compliance" with Rule 11, and Camden did not need to worry about a directional survey. Camden believed that Commission staff would approve the well's location if the inclination surveys showed the well

was on the Casas Lease, as long as the well did not have a "top to bottom" directional survey.

After learning from the partial directional survey that the Casas No. 1 had drifted to the WNW, Camden did not switch to a pendulum bottomhole assembly or run a mud motor to take control of the well because: (1) a pendulum BHA tends to deviate more than a packed hole assembly; and (2) the cost of using a mud motor to steer the well would have been significant. A packed hole assembly is used to maintain angle, and Camden believed if it held angles under three degrees, the well would comply with Rule 11. After getting the results of the partial directional survey, Camden believed it had no reason to do anything other than maintain angle of the wellbore. After the partial directional survey was completed at a depth of 12,550', the Casas No. 1 continued to drift toward SWEPI's lease line. Camden asserts that it did not intentionally deviate the well.

Total cost of drilling and completing the Casas No. 1 was about $4,400,000. Camden estimates that the cost of drilling a replacement well for the Casas No. 1 would be about $4,700,000, and the cost of sidetracking the well to a regular location would be about $3,078,000. The directional tools and services component of the estimated cost to drill a replacement well is $250,000, and the directional tools and services component of the estimated cost to sidetrack the well is $150,000.

Camden's Consulting Petroleum Engineer

Camden retained Rick Johnston, an expert in petroleum engineering, to study and address both the Rule 11 and Rule 37 issues.

The April 2004 Gas Proration Schedule for the Rosita, E. (Wilcox Cons.) Field shows three operators in the field: Camden, SWEPI, and Kebo Oil & Gas, Inc. Seven wells are carried in the field, but two of these, the SWEPI Kilgore-Wernecke GU No. 2 ("KWGU #2") and the L. C. Weatherby East GU No. 1 ("LCWE GU #1"), have Rule 14(b)(2) extensions and are no longer producing.

The Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log) for the Casas No. 1 shows that the well was completed on April 2, 2001, the perforations are at 15,840' to 15,888', and TD is 16,850'. The Form W-12 (Inclination Report) for the Casas No. 1 shows accumulative total displacement of the well at TD of 467.105'. The well had relatively low angles of inclination down to about 9,600' (0.250 degrees to 3.0 degrees). Thereafter, the angles varied but generally increased, particularly below 13,625' (1.520 degrees to 5.220 degrees).

The partial directional survey on the Casas No. 1 was run from 9,050' to 12,550'. The inclination survey at 9,000' showed an angle of two degrees, and the angle at the first survey point on the partial directional survey at 9,050' was 2.8 degrees. At the bottom of the interval where the partial directional survey was run, the angle dropped back to 1.7 degrees.

A surveyor's plat showing the bottomhole location of the Casas No. 1 as per the complete

directional survey run at Camden's direction on August 21, 2003, places the bottomhole 80' FWL and 390' FNL of the Casas Lease. The top of the subject formation in this well is at 15,826', 112' FWL and 422' FNL. The bottom of the formation in the well is at 15,930', 108' FWL and 419' FNL. The Casas Lease is about 975'-980' wide, and the surface location of the Casas No. 1 is roughly in the center of the lease east to west. There is a 46' window in the center of the lease east to west, where a well would be at a regular location, considering applicable 467' lease line spacing.

Johnston performed a study of wells in the Rosita, E (Wilcox Cons.), Rosita, NW (Wilcox S.) and Rosita, NW (Wilcox Cons.) Fields within an area slightly less than 2.5 miles, surrounding but mostly west of the Casas Lease. Ten SWEPI wells within this area in the Rosita, NW (Wilcox S.) and Rosita, NW (Wilcox Cons.) Fields, that were not directionally drilled, had W-12 displacement ranging from 401.07' to 731.74' at total depths ranging from 13,560' to 16,163'. The distance from the surface locations of these ten wells to the nearest lease line ranged from 467.5' to 1,353'. Six of these wells had W-12 displacement that would place the bottomhole locations closer to the nearest lease line than 467', if it were assumed that all of the displacement was in the direction of the nearest lease line. One of these wells, the Weatherby-Wernecke GU No. 5, had W-12 displacement of 666' and a directional survey was run placing the as-drilled bottomhole location 407' FWL. SWEPI was not required by Commission staff to obtain a Rule 37 exception for this bottomhole location, although in this instance, SWEPI was its own offset to the west.

Seven wells in Johnston's study area completed in the Rosita, E. (Wilcox Cons.) Field had W-12 displacement ranging from 104.43' to 828.56' at total depths ranging from 9,000' to 16,900'. Distance from the surface locations of these seven wells to the nearest lease line ranged from 470' to 1,300'. Of the seven, four, including the Casas No. 1, had W-12 displacement that would place the bottomhole locations closer to the nearest lease line than 467', if it were assumed that all of the displacement was in the direction of the nearest lease line. Two of these seven wells were directional wells, and five had directional surveys. Kebo Oil & Gas, Inc., directionally drilled the Casas No. 2 on the Casas Lease at a regular surface location and steered the well to a regular bottomhole location.

Johnston analyzed the results of use of packed hole assemblies compared to pendulum bottomhole assemblies in the drilling of the study area wells. According to Johnston, most wells in the area have shown a tendency to drift to the northwest. In the industry, it is generally expected that use of a pendulum BHA will drop inclination angle. However, Johnston's study of area wells demonstrated inconsistent results from use of a pendulum BHA. In some cases, use of the pendulum BHA had the effect of reducing angle, and in other cases, it did not. Johnston concluded that: (1) running a pendulum BHA does not necessarily drop angle and drill a straighter hole; and (2) SWEPI has experienced well deviations that are equal to or exceed the deviations experienced by Camden in drilling the Casas No. 1.

"Drilling a Straight Hole," a 2000 publication of the Petroleum Extension Service at the University of Texas and the International Association of Drilling Contractors, says that operators usually drill wells in crooked hole country with some type of packed hole assembly because it permits maximum weight to be run on the bit for faster rates of penetration. It also states that the best approach to use when drilling in crooked hole country is to employ preventive measures, including drilling a shallow and vertical hole, selecting the best drilling method for the area (standard rotary, air rotary, air percussion, or downhole mud

motor), an appropriate bottomhole assembly, and reducing weight on bit as much as possible. This publication further says that operators generally use a pendulum BHA for drilling soft, unconsolidated formations where fast penetration rates can

be maintained with lighter weight on bit and as a corrective measure to reduce angle when deviation exceeds the maximum allowed.

Johnston also plotted weight on bit versus depth and RPM of drill string versus depth for the study area wells. In drilling the Casas No. 1, below 12,500', Camden drilled with weight on bit in a range of 2,000 lbs. to 10,000 lbs. As it got deeper in the hole, Camden ran more weight on bit, in a range of 5,000 lbs. to 14,000 lbs. RPM, for the most part, was in a range of 120 to 140. When Camden neared the bottom of the hole, RPM was reduced to a range of 80 to 100. Johnston believes SWEPI did something comparable with respect to its most recently drilled area well, the LCWE GU #2.

At the end of the partial directional survey on the Casas No. 1 at 12,550', Camden had an inclination survey reading of about 1.7 degrees. At that point, Camden was able to make a calculation to determine whether the well would cross the lease line, if the angle were maintained. If angle had been held from 12,550' to TD of 16,850', the incremental displacement would have been 127'. From the surface to 9,000', inclination surveys indicated 94' of displacement, and the partial directional survey from 9,050' to 12,550' showed 137' of displacement. Total calculated displacement would have been 358', as compared to 473' from the surface location of the well to the nearest lease line.

Johnston sponsored and interpreted an April 3, 1996, memorandum to the Commissioners from David Schieck, then Director of the Oil & Gas Division ("Schieck Memo"), concerning "Administrative Determination Whether New Drilling Permit is Required for Wells Deviated Pursuant to Statewide Rule 11". According to Johnston's interpretation, the Schieck Memo is to the effect that if accumulative displacement (indicated by the Form W-12 Inclination Report) does not exceed the distance to the nearest lease line, the well is deemed in compliance with Rule 11.[1]

Camden's Consulting Drilling Practices Expert

Camden retained Preston Moore, a petroleum engineer and author of "Drilling Practices Manual", to assess whether Camden drilled the Casas No. 1 as nearly vertical as possible by normal, prudent, practical drilling operations.

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[1] The Schieck Memo says that: "The inclination survey records only the angle that the wellbore deviates from the vertical; it does not indicate compass direction that the hole drifts. Only when the inclination survey indicates total displacement from true vertical well course could have exceeded the permitted distance to the nearest lease line is the well considered to be in violation of its permit." However, the memo also says that: "The directional survey identifies deviation from the vertical well course between survey points and also identifies the compass direction of each of the displacement points. If the directional survey places the well's completion interval location on the lease but closer to the lease line than the W-1 permitted location, a new permit is required if the Commission establishes that the location does not meet the standard of 'reasonableness'."

To drill the Casas No. 1, Camden used a diamond compact bit, which is a fixed bladed bit with cutting surfaces mostly on the edge of the bit. Diamond compact bits tend to walk less than a roller cone bit, and Moore believes that Camden's use of this type of bit was prudent.

A pendulum BHA is used to straighten a hole, combined with light weight on bit and high rotary speed. In a lot of cases this works, and in a lot of cases it doesn't. SWEPI has not had consistent results from use of the pendulum BHA in this area. Moore believes that Camden's decision not to switch from a packed hole assembly to a pendulum BHA in drilling the Casas No. 1 was prudent, because at 12,550' the angle was only 1.7 degrees, and the well was "almost straight".

Moore believes that when a packed hole assembly is used, it makes no difference whether more or less weight on bit is used or whether higher or lower RPM is used. With use of a packed hole assembly, bit direction is not affected by weight on bit or RPM. Moore's "Drilling Practices Manual" states that "a packed hole assembly is the best method of controlling inclination and direction." According to Moore, a packed hole assembly will almost always hold angle, but it will not always hold direction. Moore believes that Camden's use of a packed hole assembly was prudent.

Moore does not believe that Camden should have used a mud motor to steer the Casas No. 1 after Camden learned from the partial directional survey that the well was drifting to the northwest, because at that point the angle was only 1.7 degrees. At this point, Camden could have brought the Casas No. 1 back to a regular location by running a mud motor. Use of a mud motor to steer a well that has drifted can be prudent, but in this case, Moore would not have recommended it.

When formation beds dip at more than ten degrees, crooked hole problems become a common problem. Moore believes that in planning wells, it is prudent for an operator to: (1) look at offsetting wells to determine how they were drilled; (2) obtain directional surveys and other information from the Commission; (3) determine the desired bottomhole location; (4) take into consideration the narrowness of the drillsite tract; (5) take into consideration the depth of the well; (6) take into consideration the lease lines involved; and (7) study the dips of beds along the target zone (because bits tend to walk up dip); and (8) study drift of wells in the field area in general.

The Rule 37 Issues

Rick Johnston, Camden's consulting expert in petroleum engineering, presented most of Camden's proof on the Rule 37 issues.

The Form G-1 for the SWEPI KWGU #2, the discovery well for the Rosita, E. (Wilcox Cons.) Field shows: (1) the well was completed on December 4, 1997; (2) as of April 28, 1998, the well had a shut-in bottomhole pressure of 12,461 psi; (3) the well has a completion interval from 16,340' to 16,360'; and (4) the well was frac'd with 212,320 lbs. of proppant.

Camden did not prepare a structure map, isopach map, or hydrocarbon pore volume map, but

instead relied upon maps prepared by or for SWEPI. An October 21, 2003, SWEPI "Z Sand Net Pay Isopach" map gives the Casas No. 1 24' of net pay. To the east of the Casas Lease, the Benavides No. 1 is given 13' of net pay, and the Kebo Casas No. 2 to the south of the Casas No. 1 is given 4' of net pay. To the northwest of the Casas No. 1 surface location, both net pay and hydrocarbon pore

volume improve, as represented by SWEPI's isopach and hydrocarbon pore volume maps. Johnston believes that it is SWEPI's interpretation that there is a thinning of the reservoir to the southeast.

A structure map of the Rosita, E. sand structure prepared for SWEPI by Robert Hilty, a consulting geologist, shows that to the northwest of the Casas No. 1 there is a fault, and orientation of the fault is northeast to southwest. The area of the Rosita, E. sand structure beneath the Casas Lease is about 65.5 acres.

Johnston presented production decline curves for wells that have produced from the Rosita, E. (Wilcox Cons.) Field. Starting in the latter part of 2002, the Casas No. 1 settled into a fairly predictable decline. The Casas No. 1 has cumulative gas production of 7,023.79 MMCF, historical cumulative oil production of 1.62 MBBL, remaining recoverable reserves from April 2004 forward of about .6 BCF, a gas EUR of 7,626.48 MMCF, and an oil EUR of 1.62 MBBL.

The SWEPI KWGU #3, southwest of the Casas No. 1, which continues to produce, has cumulative gas production of 7,449.79 MMCF and a gas EUR of 8,405.28 MMCF. The EUR calculation for this well uses exponential decline. The fact that the decline may have been hyperbolic between 2000-2002, if taken into account, could result in an increase in the calculated EUR for this well.

The SWEPI LCWE GU #2, northeast of the Casas No. 1 has cumulative gas production of 1,055 MMCF, remaining recovery of 259.84 MMCF, and a gas EUR of 1,332.68 MMCF.

The Kebo Casas No. 2, directly south of the Casas No. 1, has not been a good well, and is not currently producing at a level that covers estimated operating expenses, this being the reason that computer generated remaining recovery for the well is zero. The cumulative gas production for the well is 43.87 MMCF and the calculated EUR is 46.47 MMCF.

The SWEPI KWGU #2 was the best well in the Rosita, E. (Wilcox Cons.) Field. This well is located to the northwest of the Casas No. 1 on the west side of the fault depicted on the Hilty structure map. The well last produced in 2002, and had cumulative gas production of 13,625.57 MMCF.

The SWEPI LCWE GU # 1, to the northeast of the Casas No. 1, last produced in 1999. This well had cumulative gas production of 788.05 MMCF.

Seven wells have been carried in or have produced from the Rosita, E. (Wilcox Cons.) Field: the KWGU #2, LCWE GU #1, KWGU #3, Casas No. 1, LCWE GU #2, Casas No. 2, and Benavides No. 1. Cumulative production by these wells is 30.013 MMCF. Estimated remaining recovery for the wells is 1,761 MMCF. There are only three wells, the KWGU #3, Casas No. 1, and LCWE GU #2, that

appear to have remaining reserves that are economic. The Casas No. 2 and Benavides No. 1 are still producing, but are below economic limit based on Camden's costs.

From a P/Z plot for the seven wells that have been carried in or have produced from the subject field, Johnston calculated current reservoir bottomhole pressure of 6,465 psi. Future drainage areas for remaining reserves, calculated from the current estimated bottomhole pressure of 6,465 psi down to an abandonment pressure of 5,000 psi, are as follows: KWGU #3 - 60 acres (909' radius); Casas No. 1 - 106 acres (1,210' radius); and LCWE GU #2 - 22 acres (553' radius). These calculations assume circular drainage. In Johnston's opinion, these future drainage area calculations show that the KWGU #3 and the LCWE GU #2 will not recover the remaining reserves (603 MMCF) that will be recovered by the Casas No. 1. The KWGU #3 has an estimated drainage radius of 909' and is 2,650' from the bottomhole location of the Casas No. 1. The LCWE GU #2 has an estimated drainage radius of 553' and is 1,525' from the bottomhole location of the Casas No. 1.

Johnston acknowled that the well data for the principle wells that are producing or that have produced from the Rosita, E. (Wilcox Cons.) Field show that the wells have great communication. A bottomhole pressure survey for the Casas No. 1 run on April 25, 2001, showed a bottomhole pressure of 7,923 psi at 15,878'. Virgin pressure for the field was 12,600 psi to 13,000 psi. The depleted pressure in the Casas No. 1 shows good communication between this well and other producing wells in the field.

Johnston believes that the drift to the northwest of the Casas No. 1 caused no greater harm to SWEPI than if the well had been bottomed directly beneath the surface location. This drift placed the bottomhole location of the Casas No. 1 175' further away from the LCWE GU #2 and about 200' closer to the KWGU #3.

Based on planimetering of Hilty's hydrocarbon pore volume map and the estimated current reservoir bottomhole pressure of 6,465 psi from Johnston's P/Z plot, and assuming an abandonment pressure of 5,000 psi, Johnston volumetrically calculated that current recoverable gas beneath the Casas Lease is 245 MMCF. The difference between the 245 MMCF beneath the Casas Lease and the estimated remaining recovery of the Casas No. 1 of 603 MMCF will come from the surrounding leases. Recoverable reserves for the Casas Lease calculated by using a bottomhole pressure of 7,938 psi, which was the bottomhole pressure in the Casas No. 1 when it was completed, were 451 MMCF. The Casas No. 1 has to date produced about 6.5 BCF more than the recoverable gas in place beneath the Casas Lease at the time the well was completed.

Hilty, SWEPI's consulting geologist, testified by deposition in separate litigation that seismic amplitude condemned most of the Casas Lease, only a small portion of the lease had any amplitude, and amplitude for the lease was insufficient to establish a well at a legal location.

Johnston concluded that: (1) if the Casas No. 1 had been drilled to a bottomhole location directly beneath its surface location, it would have encountered productive reservoir, but the hydrocarbon pore volume would have been less than at the as-drilled bottomhole location; (2) the depleted pressure in the Casas No. 1 when drilled shows that recoverable gas under the Casas Lease had been drained by other

wells in the field; (3) the other currently producing wells in the field, the LCWE GU #2 and the KWGU #3, are not capable of producing the remaining recoverable reserves that will be recovered by the Casas No. 1; and (4) if Camden's Rule 37 application is denied and the Casas No. 1 is shut-in, the .6 BCF that the Casas No. 1 would otherwise recover will remain in the reservoir forever, because the cost to drill a new well to recover these reserves would exceed the value of the reserves.

KLT Gas, Inc.

KLT retained Terry Payne, an expert in petroleum engineering, to prepare and present KLT's evidence on the Rule 11 and Rule 37 issues.

(a) The Rule 11 Issues

The bottomhole location of the Casas No. 1 is 80' from SWEPI's lease line. The W-12 Inclination Report shows that at 9,000', this well had 94.392' of accumulative displacement. The partial directional survey run on the Casas No. 1 shows the direction and angle of the wellbore from 9,050' to 12,550' and that in this interval, the well drifted 76.65' north and 114.75' west, for a total course length of 137.84'.

It is now known from the complete directional surveys that were run in 2003 that down to 9,050', the Casas No. 1 was drifting to the west. However, from the perspective of what was known at the time the well was being drilled, even if it were assumed that all of the accumulative displacement down to 9,000' shown by the inclination surveys (94.392') were to the east, the known deviation to the north and west shown by the partial directional survey run on February 15, 2001, placed the well closer to SWEPI's lease line than 467' at a depth of 12,550'. Conversely, if, at the time the well was being drilled, the assumption had been made that all of the accumulative displacement shown by the inclination surveys down to 9,000' were to the west, the known deviation to the north and west shown by the partial directional survey would have placed the well more than 200' closer to SWEPI's lease line than 467' at a depth of 12,550'.

The two 2003 complete directional surveys on the Casas No. 1 showed similar wellbore drift to the north and west. These surveys show that below a depth of 12,550', which was the deepest point of the interval where the partial directional survey was run, the well held both angle and direction. Payne believes that after receipt of information from its oil and gas consultant regarding Commission staff's policy on well deviations, Camden's actions were not consistent with an attempt to bring the well back to vertical. RPM actually decreased from 150 down to about 75 and weight on bit increased. According to Payne, these actions, together with continued use of a packed bottomhole assembly, were likely to maintain angle, not reduce it.

The Casas Lease is about 980' wide, east to west. Holding wellbore angle to a general industry standard of three degrees will not work for this lease at the depth of the Casas No. 1. If the Casas No. 1 had held a three degree angle from surface to TD, the well would have deviated a total of 865', about 400' across the lease line. Even a two degree angle over the entire length of the wellbore would have bottomed the well about 100' across the lease line. An angle of 1.6 degrees over the entire length of the wellbore would be required to keep the bottomhole on the Casas Lease, and a 1.0 degree angle would still

cause the well to deviate 50% of the distance from the surface location to the lease line. When Kebo Oil & Gas, Inc., drilled the Casas No. 2 on the same lease, the well was directionally drilled with a mud motor, and Kebo was able to keep the well basically in the center of the lease.

Payne believes that Camden could sidetrack the Casas No. 1 to a regular location out of either the 7 5/8ths liner or 9 5/8ths casing, and that the AFEs prepared by Camden show that for a cost of directional tools and services of $150,000-$250,000, Camden could have brought the well back to a regular location.

(b) The Rule 37 Issues

Payne agreed that a total of seven wells have been carried in the Rosita, E. (Wilcox Cons.) Field for proration purposes. However, two of these, the Casas No. 2 and Benavides No. 1, are believed not to be in the same reservoir as the remainder of the wells. The perforated interval in these two wells is not correlative to the "Z Sand" in the subject field, and these wells are not in communication with the other wells in the field. Payne believes that the only wells that are any longer relevant to the Rule 37 issues are the Casas No. 1, KWGU #3, and LCWE GU #2.

Pressure data for wells in the subject field, except the Casas No. 2 and Benavides No. 1, show pressure depletion and pressure trends indicative of very good communication among all the wells in the reservoir. As each of the wells was drilled, the well came in with substantially depleted pressure, indicating that reserves in the area of the wells had been produced by other wells in the field. Payne believes that the three currently producing wells in the field, the Casas No. 1, KWGU #3, and LCWE GU #2, are competing for the same reserves.

At the time the Casas No. 1 was drilled, there were two other wells producing from the Rosita, E. (Wilcox Cons.) Field, the KWGU #2 and KWGU #3. The production decline curve of the KWGU #2 changed substantially after the Casas No. 1 came on in April or May 2001, indicating interference between these wells. Payne believes that the production decline curve of the KWGU #2 shows that the Casas No. 1 and KWGU #2 were competing for the same reserves, as evidenced by the accelerated decline in gas rate and flowing tubing pressure of the KWGU #2 after the Casas No. 1 started to produce. Initial reservoir pressure in the Casas No. 1 was 7,923 psi, and at the time, there were only three wells in the field, including the KWGU #2, that could have caused the depletion from original reservoir pressure.

Payne believes that shutting-in the Casas No. 1 will not cause the waste of hydrocarbons. The area of the field in which the Casas No. 1 is located was being produced by other wells in the field long before the Casas No. 1 was drilled. There is nothing to indicate that the wells in the field that are still producing, the Casas No. 1, KWGU #3, and the LCWE GU #2 are not still in communication.

Camden's petroleum engineering expert estimated an EUR for the SWEPI KWGU #3 of 8.4 BCF. However, Camden's expert used a hyperbolic decline to calculate EUR for the Casas No. 1 and LCWE GU #2 and an exponential decline for the KWGU #3, even though the KWGU #3 demonstrates a hyperbolic trend from about 5 BCF out. Payne does not believe that it is an unreasonable expectation that

the KWGU #3 will produce the approximately 600 MMCF of remaining reserves for the Casas No. 1, if the Casas No. 1 is shut-in, giving the KWGU #3 an EUR of 9.008 MMCF. In Payne's opinion, the KWGU #3 and LCWE GU #2 will produce any reserves that may remain under the Casas Lease.

Payne believes the drainage area calculations of Camden's expert are unreliable and wrong for several reasons: (1) pressure depletion in the LCWE GU #1, drilled six months after and 2,000' away from the KWGU #2, shows pressure communication between these wells and that the KWGU #2 had a drainage area greater than the 1,439' radius calculated by Camden's expert; (2) recovery factors calculated by Camden's expert are a problem because in some cases static pressure data suggests that the G-1 pressures used in the calculation are wrong, the calculation of recovery factors assumes a depletion drive reservoir, whereas there is a suggestion that water drive or compaction factors may be at play, and extrapolation of the P/Z plot used by Camden's expert yields 95 BCF of gas in place, whereas it is known from planimetering the hydrocarbon pore volume map relied upon by Camden that there are only 54 BCF in the reservoir; (3) the drainage area calculations show that ultimately 1,125 acres will be drained in the subject reservoir, whereas it is known that the reservoir contains only 574 acres; (4) all calculated future drainage areas for wells in the field are smaller than the calculated ultimate drainage areas for the same wells, which should not be the case; and (5) Camden's expert used his P/Z plot to estimate current reservoir bottomhole pressure of 6,465 psi and, assuming a field EUR of 31.85 BCF, abandonment pressure calculated from the P/Z plot is 6,200 psi, whereas the drainage area calculations assume a drop in pressure from 6,465 psi to an abandonment pressure of 5,000 psi.

The conclusion could be drawn from the rising water yield in the KWGU #3 that the gas-water contact is rising in this reservoir and is approaching the perforations in the KWGU #3, but examination of the other producing wells in the field shows that there is no correlation between structure and water yield. Of the three remaining wells in the field, the Casas No. 1 is the highest structurally. However, the Casas No. 1 has a higher water yield than the LCWE GU #2. This means to Payne that there is not necessarily an advancing water level, but rather water production is resulting from compaction of the formation. Generally, the last surviving well in a field with a rising water contact is the well which is highest structurally, but here Camden's expert projects that the well which is lowest on structure of the three remaining wells, the KWGU #3, will produce for the longest period of time.

SWEPI LP

SWEPI'S Consulting Geologist

SWEPI retained an expert in geology, Robert Hilty, to give testimony regarding the Rule 11 and Rule 37 issues.

In the subject area of the reservoir, seismic shows that dips above 8,000' are fairly gentle. The deviations in wellbores occur below 8,000' and above the "Z Sand," where dips are 11-12 degrees. Seismic shows that area wells have encountered steep east dip from 9,000'-15,000'. Wells in this area have a tendency to drift from east to west. The slope in beds above the depth of the Casas No. 1 bottomhole can be seen from the 3-D seismic that Camden purchased prior to drilling the Casas No. 1.

Hilty believes that the westerly drift of the Casas No. 1 could have been anticipated.

Experience in drilling the KWGU #2, LCWE GU #1, and KWGU #3 during 1997-1998 caused SWEPI to conclude that high amplitude areas shown by seismic were favorable drilling prospects and areas of low amplitude were not. The regular surface location of the Casas No. 1 does not have high amplitude, but 2-3 acres in the northwest corner of the Casas Lease are in an area of high amplitude.

Hilty's latest structure map shows a northeast to southwest trending fault to the northwest of the Casas No. 1, which appears to separate the Casas No. 1 and the KWGU #2. The throw of the fault on a straight line between these two wells is about 100'. However, the fault appears to terminate to the south and weaken to the north. In deposition testimony, it was Hilty's opinion that this might be a sealing fault. Because engineering data has shown communication between wells across the fault, he now concludes that the fault is not an effective barrier to communication between wells across the fault.

The KWGU #2 was drilled on a high amplitude anomaly at a location about 300' down dip from the highest structural position in the field. The LCWE GU #1 was 20' low to the KWGU #2, and lasted for only 8 months. The KWGU #3 was high to the KWGU #2 by about 150'. Hilty believes that structure in the reservoir is important in that wells should not be drilled too far down dip, but reservoir quality is more important than structure. The Casas No. 1 has been a better well than expected because its bottomhole drifted to the better part of the reservoir.

The KWGU #2 ceased to produce due to water influx, and, to the south, the KWGU #3 has an increasing water yield. It is possible that the water level is rising, coming around the southwest end of the fault, and now hitting the KWGU #3. However, Hilty has not studied water influx, or whether water being produced is connate water. He deems it significant that none of the area wells has penetrated a water level. The first well to water out, the LCWE GU #1, is near the LCWE GU #2 that produces the least amount of water, so that the cause of water yield in wells is uncertain.

The "Z Sand" has 3,472 acre feet of Sg Phi h, 54.0 BCF of gas in place, and an EUR of 31.1 BCF. The Casas Lease has 4.15% of the Sg Phi h, 2.2 BCF of original gas in place, 7.0 BCF of cumulative production as of March 31, 2004, and an EUR of 7.6 BCF. The L. C. Weatherby Gas Unit has 26.16% of the Sg Phi h and only 6.5% of the cumulative production, while the Casas Lease has 4.15% of the Sg Phi h and 24.3% of the cumulative production. Hilty believes that the Casas No. 1 has already produced more than its fair share.

In Hilty's opinion, a well at a regular location on the Casas Lease would allow Camden to recover the remaining recoverable hydrocarbons beneath the Casas Lease. In 2000, Hilty concluded that a well at a regular location on the Casas Lease would not be a commercial well, but today he believes it would be, based on his Sg Phi h map. It is unknown whether it would be economically feasible to sidetrack the Casas No. 1 to a regular location to recover remaining reserves. According to Hilty, if the Casas No. 1

were shut-in, the other two producing wells would recover the remaining recoverable hydrocarbons in the field.

SWEPI's Consulting Petroleum Engineer

Ricardo Garza, a registered professional engineer, also presented testimony in support of SWEPI's opposition to Camden's application.

Garza's volumetric calculations show 573.7 acres in the Rosita E. (Wilcox Cons.) Field, original gas in place for the field of 54.0 BCF, and original gas in place beneath the Casas Lease of 2.24 BCF. Because the Casas No. 1 has about 7.0 BCF of cumulative production, Garza concluded that this well has caused drainage from offsetting tracts. Garza agreed, however, that before the Casas No. 1 was drilled, the Casas Lease had been drained in the amount of about .6 BCF by the KWGU #2 and the KWGU #3. Garza disputed the drainage area calculations of Camden's expert in petroleum engineering because of his use of a flawed P/Z plot that extrapolates to 95 BCF of gas in place. Garza believes that this should have caused alarm that something was not right with the P/Z plot and that it should not be used to calculate drainage areas.

SWEPI's Consulting Drilling Expert

SWEPI retained the services of Kenneth Gray, a professor of petroleum engineering at the University of Texas, to give testimony in his area of specialty, which is drilling and rock mechanics.

From his review of the record from the 2001 hearings in Docket Nos. 04-0229075 and 04-0229076, Gray determined that in drilling the Casas No. 1, Camden used a packed bottomhole assembly. This type of bottomhole assembly is designed to hold angle and direction while drilling. After a partial directional survey was run on the Casas No. 1 and it was known that the well was drifting to the northwest, Camden continued to use the packed hole assembly. This was not calculated to bring the well back beneath the surface location.

At around 12,500', Camden could have used a "build assembly" or pendulum bottomhole assembly in an attempt to straighten the well. If these were unsuccessful, Camden could have used whipstock, a physical means to divert a well in some desired direction. It could have also changed bits, since the PDC bit it was using tends to go straight ahead. Increasing rotary speed and reducing weight on bit also should have been attempted. This is true because: (1) increasing rotary speed tends to reduce right hand walk; and (2) the more weight on bit, the more the tendency of a well to walk and build angle. Gray believes that increasing rotary speed and reducing weight on bit could have had some results, although he agreed that these factors do not make a great difference where a packed bottomhole assembly is being used.

EXAMINERS' OPINION

The "Collateral Attack" Issue

On July 6, 2001, apparently after the partial directional survey for the Casas No. 1 had been filed with the Commission by Schlumberger, the Commission's Engineering Unit sent Camden a letter stating that: (1) the well might not be in compliance with Statewide Rule 11(c)(1)(A); (2) administrative review could not confirm that the well was drilled as nearly vertical as possible; and (3) completion papers could not be further processed and an allowable could not be assigned until Camden submitted additional data demonstrating that the well had been drilled as nearly vertical as possible or an amended Form W-1 was filed and a Rule 37 obtained for the as-drilled bottomhole location. On July 24, 2001, SWEPI filed a complaint with the Commission regarding the Casas No. 1.

On July 30, 2001, the Commission docketed two proceedings regarding the Casas No. 1 and assigned them Oil & Gas Docket No. 04-0229075; *Commission Called Hearing to Determine If the Camden Resources, Inc. Casas Unit Well No. 1, Rosita, E. (Wilcox Cons.) Field Is In Compliance With Statewide Rules 11 and 37* and Oil & Gas Docket No. 04-0229076; *Commission Called Hearing On the Complaint of Shell Western E & P Regarding the Camden Resources, Inc. Casas Unit Well No. 1, Rosita, E. (Wilcox Cons.) Field, Duval County, Texas.* These dockets were heard on November 14-15, 2001.[2]

Following the hearing and issuance of a proposal for decision, the Commission issued final orders in Docket Nos. 04-0229075 and 04-0229076 on May 9, 2002. These final orders adopted findings, *inter alia*, that SWEPI had failed to show probable cause to suspect that the Casas No. 1 was not bottomed on the Casas Lease, and Camden was not required to run a directional survey pursuant to Statewide Rule 11(c). In the final orders, the Commission concluded, among other things, that the Casas No. 1 was drilled in compliance with Statewide Rules 11 and 37, and the well should be assigned an allowable effective May 25, 2001.

The examiners understand Camden to contend that this Rule 37 case involves an impermissible "collateral attack"on the Commission's final orders in Docket Nos. 04-0229075 and 04-0229076. A collateral attack on a judgment is an attempt to avoid its binding effect in a proceeding not instituted for such purpose, or, stated differently, an attack on a judgment to avoid its binding force to obtain some relief against which the judgment stands as a bar. *Subsequent Injury Fund, State of Texas v. Service Lloyds Ins. Co.*, 961 S.W.2d 673, 678 (Tex. App.-Houston 1998, pet. denied); *Cantu v. Butron*, 921 S.W.2d 344, 348 (Tex. App.-Corpus Christi 1996, writ denied).

This is a hearing on an application filed by Camden for a Rule 37 exception for its Casas No. 1 well. Camden has also requested alternative relief in the form of a Commission finding that the location of the Casas No. 1 is "reasonable" and that a Rule 37 exception permit is not required under Statewide Rule

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[2] Pursuant to Camden's request, the examiners have officially noticed the record, proposal for decision, and Commission orders in these dockets.

11. Camden is the proponent of both of these alternative forms of relief. The hearing was not called to consider a complaint of SWEPI or KLT regarding the well's compliance with Rule 11 or Rule 37. Neither SWEPI nor KLT has brought an action, at least in this docket, to "collaterally attack" the Commission's prior final orders, and it would be illogical to conclude that by its application for a Rule 37 exception, Camden seeks to "collaterally attack" prior final orders that were wholly favorable to Camden.

The examiners therefore conclude that Camden's "collateral attack" argument is, in substance, a contention that the Commission's prior final orders are *res judicata* on the issue of whether the Casas No. 1 was drilled in compliance with Statewide Rules 11 and 37. Generally, *res judicata* is the generic term for a group of related concepts concerning the conclusive effects given final judgments. Within the general doctrine of *res judicata* is issue preclusion, a concept that precludes the relitigation of identical issues of fact or law actually litigated and essential to a final judgment in prior proceedings. In essence, Camden contends that in the prior final orders the Commission concluded that the Casas No. 1 was drilled in compliance with Statewide Rules 11 and 37, and this precludes the Commission from concluding here either that the location of the well is not "reasonable" within the meaning of Rule 11 or that the well requires a Rule 37 exception permit.

The examiners disagree with Camden's position on this issue. This issue has been ruled upon in the examiner's November 11, 2003, denial of Camden's motion to dismiss its Rule 37 application. The motion to dismiss asserted virtually the identical argument as is made by Camden here. Camden appealed the examiner's ruling to the Commission pursuant to §1.30(c)(2) of the Commission's General Rules of Practice and Procedure, and because the Commission chose not to act, the appeal was denied by operation of law.

The Commission's final orders in Docket Nos. 04-0229075 and 04-0229076 are not *res judicata* because: (1) the prior final orders did not decide the issues involved here; (2) material facts have changed and/or new facts are known since issuance of the prior final orders; and (3) the conclusion in the prior final orders that the Casas No. 1 was drilled in compliance with Statewide Rules 11 and 37 was not necessary or essential to the prior adjudication.

This issues involved here are: (1) whether the bottomhole location of the Casas No. 1 is "reasonable"; (2) whether a Rule 37 exception is required for the well's bottomhole location; and (3) whether the granting of a Rule 37 exception for the well's bottomhole location is necessary to prevent waste or confiscation. None of these issues was, or could have been, decided in the final orders in Docket Nos. 04-0229075 and 04-0229076 for the simple reason that at the time of issuance of these final orders, the bottomhole location of the Casas No. 1 was not known.

The proposal for decision in Docket Nos. 04-0229075 and 04-0229076, and the findings of fact adopted in the Commission's final orders in these dockets, make it plain that what the hearing examiners and the Commission considered in the prior dockets was: (1) whether the Form W-12 Inclination Report for the Casas No. 1 reliably established that accumulative displacement was less than the distance from the

well's surface location to the nearest lease line; (2) whether Camden was required to run a complete directional survey sufficient to establish the well's bottomhole location; and (3) whether the well was entitled to an allowable based on the facts that were then established.

In the context provided by the findings of fact recommended in the proposal for decision in the prior dockets and adopted in the prior final orders, the conclusion that the Casas No. 1 complied with Statewide Rule 11 meant only that the Inclination Report did not establish accumulative displacement that exceeded the distance from the well's surface location to the nearest lease line and a complete directional survey was not required by Rule 11. In the same context, the conclusion that the well complied with Statewide Rule 37 meant only that the surface location of the well was regular, and it had not been established in the prior dockets that the well had been drilled in violation of Rule 37 or that the well required a Rule 37 exception.

Even if broader meaning plausibly could be ascribed to the conclusion in the prior final orders that the Casas No. 1 was drilled in compliance with Statewide Rules 11 and 37, material facts have changed since issuance of the prior final orders, or, at least, new facts presently are known that were unknown at the time the prior final orders were issued. Changed or "new" factual circumstances include, most importantly, that two complete directional surveys have been run on the Casas No. 1 pursuant to court order, the angle and direction of deviation of the well from surface to TD is known, and the bottomhole location of the well about 80' from the west line of the Casas Lease is known. A final order or judgment in a prior adjudication will not operate as *res judicata* in a subsequent proceeding, even on the same question between the same parties, where, in the interval, the facts have changed, or new facts have occurred, which may alter the legal rights or relations of the parties. 48 Tex.Jur.3d §406 at page 312; *Marino v. State Farm & Cas. Ins. Co.*, 787 S.W.2d 948, 949-950 (Tex. 1990); *Metromedia Long Distance, Inc. v. Hughes*, 810 S.W.2d 494, 499 (Tex. App.-San Antonio 1991, writ denied).

Finally, the conclusion in the prior final orders that the Casas No. 1 was drilled in compliance with Statewide Rules 11 and 37 was purely collateral to the main issues of whether Camden was required to run a complete directional survey and whether the well was entitled to an allowable. Stated another way, the conclusion was not essential or necessary to the adjudication of the prior dockets. A final order or judgment is not conclusive of purely collateral matters, a decision on which was not necessary to an adjudication in a prior proceeding, even though such collateral or incidental matter was in fact adjudicated. 48 Tex.Jur.3d §409 at page 317.

The Rule 11 Issues

Rule 11

Rule 11(a) provides, in general, that all wells shall be drilled "as nearly vertical as possible by normal, prudent, practical drilling operations." Rule 11(c)(1)(A) provides that when an operator runs a directional survey on a well, and the directional survey shows the well to be bottomed within the confines

of the operator's lease, but nearer to a well or lease line or pooled unit boundary than allowed by applicable rules, a new permit will be required if it is established that the bottomhole location or completion location is not a reasonable location.

"Reasonable location" is not defined in Rule 11. The "Schieck Memo" suggests that for administrative purposes, the Commission's Engineering Unit attempts to determine whether the operator performed in a prudent manner to locate the wellbore as near the point directly below the surface location as is possible. This memo refers to industry practice to hold the angle of inclination from vertical to about three degrees or less, and states that when that value is exceeded, it is proper to examine: (1) at what depth the problem was observed; (2) the depth to which the well was drilled before corrective action was taken; and (3) whether there was a geologic condition, such as a fault or steeply dipping beds, that contributed to the angle and direction of hole deviation.

Burden of Proof

Rule 11(c)(1)(A) provides that in the case where a directional survey is run that shows a well is bottomed closer to a lease line than allowed under applicable rules, a new permit will be required "if it is established that the bottom hole location or completion location is not a reasonable location." Camden has argued that the burden of proof in this case to show that the bottomhole location of the Casas No. 1 is "not reasonable" is on SWEPI/KLT, not Camden.

While it is not implausible that in a particular case, such as a complaint case, the burden of proof on the Rule 11 "reasonableness" issue might fall on someone other than the operator that drilled the well, the examiners conclude that in the context of this case, the burden on proof is on Camden, notwithstanding the awkward provisions of Rule 11(c)(1)(A).

On September 30, 2003, after the complete directional surveys had been filed with the Commission showing that the bottomhole location of the Casas No. 1 was 80' from the west line of the Casas Lease, the Commission's Permit Coordinator directed a letter to Camden requiring that Camden file an amended Form W-1 and obtain a Rule 37 exception for the as-drilled bottomhole location. This letter required that Camden file the amended Form W-1 by October 14, 2003, to avoid further Commission action. It may be inferred from this letter that at the staff level at least, the bottomhole location of the Casas No. 1 had been determined to be "not reasonable." Otherwise, under Rule 11(c)(1)(A), a new permit would not be required.

Camden responded on October 14, 2003, by filing an amended Form W-1 seeking a Rule 37 exception for the as-drilled bottomhole of the Casas No. 1. As the applicant for a Rule 37 exception, Camden clearly has the burden of proof on the Rule 37 issues. On January 9, 2004, Camden filed a motion to abate the Rule 37 hearing, pending the issuance of notice and hearing on the issue of the reasonableness of the bottomhole location of the Casas No. 1 under Rule 11. The motion to abate, and

to call a separately docketed hearing on the Rule 11 reasonableness issue, was denied by the examiner on January 23, 2004, and this ruling was not appealed by Camden. However, the examiner directed that a new notice of the Rule 37 application be issued, broadening the call of the Rule 37 hearing to include consideration of the issue of whether the bottomhole location of the Casas No. 1 is reasonable under Rule 11.

In the present posture of this case, Camden contends that it does not need a Rule 37 exception permit for the Casas No. 1 because the well's bottomhole location is reasonable. The examiners consider that Camden is the proponent of a finding to this effect, and, as such, Camden has the burden of proof.

Reasonableness of Bottomhole Location

In this case, the issue of whether Camden had the burden to prove that the bottomhole location of the Casas No. 1 is "reasonable", or whether someone else had the burden to prove the bottomhole location is "not reasonable," is a matter of minor consequence, because under either standard, the evidence as a whole establishes that the bottomhole location is not reasonable.

A determination as to whether an as-drilled bottomhole location is reasonable under Rule 11 should be a fact intensive inquiry, requiring case-by-case analysis. What may be "reasonable," or what drilling practices may be deemed normal, prudent, and practical, in the case of drilling a well on a large and regularly configured lease may not apply at all to the drilling of a well on a narrow rectangular tract having only a small "window" of regular locations in the center of the tract. The Casas Lease is no more than 980' wide from east to west, and there is a 46' "window" of regular locations in the center of the Lease from east to west. Adherence to a standard of three degrees of deviation from the surface to total depth of the Casas No. 1 would have put the well's bottomhole about 400' *across* the Lease's east-west lease lines.

The complete directional survey run at Camden's direction in 2003, shows that the bottomhole location of the Casas No. 1 is 80' from the west lease line of the Casas Lease. The surface location of the well is 475' from the west line. The well drifted to bottomhole and completion locations 75% or more of the distance between the permitted surface location and the west lease line.

The evidence shows that Camden should have known, and probably did know, that a well drilled at the surface location of the Casas No. 1 would drift to the northwest. Seismic which Camden purchased and analyzed before the well was drilled showed beds in the formation with steep east dip below about 8,000'. It is conventional wisdom that when drilling through such beds, the drilling bit tends to walk up dip. Camden's expert in petroleum engineering testified that most wells in the area of the Casas No. 1 have shown a tendency to drift to the northwest. A well drilled to bottomhole and completion locations directly beneath the surface location of the Casas No. 1 would have been productive in the subject reservoir, but not as productive as a completion location in the northwest corner of the Casas Lease where seismic amplitude showed better reservoir quality. It is not established that Camden intended from the outset to

drill the Casas No. 1 to bottomhole and completion locations in the area of this high amplitude anomaly, but neither is it established that it did anything in particular to turn the well back beneath the permitted surface location once the northwest drift was known with certainty from a partial directional survey run from 9,050' to 12,550'.

It is now known from the complete directional surveys run in 2003 that the Casas No. 1 was drifting to the west almost from the start, just as should have been expected. From the perspective of what was known at the time the well was being drilled, the inclination surveys showed that down to 9,000', the well had accumulative displacement of 94.392'. At this point, compass direction of the displacement was at least theoretically uncertain, because inclination surveys measure angle but not compass direction of deviation from vertical. However, when the Casas No. 1 reached 9,050', Camden ran a partial directional survey in the interval between 9,050' and 12,550'. Both angle and compass direction were measured, and the partial directional survey showed that in the interval from 9,050' to 12,550', the well had drifted 76.65' north and 114.75' west. At this point, Camden knew with certainty that even if all of the accumulative displacement indicated by inclination surveys down to 9,000' were to the *east*, at 12,550' the well already had drifted closer to SWEPI's lease line to the west than permitted by the applicable 467' lease line spacing rule.

Certain knowledge that at 12,550' the Casas No. 1 had already drifted far enough northwest to be closer to the west line of the Casas Lease than permitted by the applicable lease line spacing rule, together with knowledge that the well was to be drilled 4,300' deeper to TD at 16,850' through beds with steep east dip, should have caused an operator, charged with the responsibility under Rule 11 to drill the well "as nearly vertical as possible by normal, prudent, practical drilling operations," to take affirmative steps to reverse or stem northwest drift and turn the well in the direction of a location beneath the permitted surface location. However, the evidence establishes that this was not Camden's objective. Instead, Camden's primary interest was in maintaining an angle that would keep the bottomhole of the Casas No. 1 somewhere on the Casas Lease, so that under Rule 11, Camden would not be required to run a complete directional survey disclosing the actual bottomhole or completion locations.

Camden drilled the Casas No. 1 with a packed bottomhole assembly from surface to TD. It is true, as Camden points out, that the literature presented into evidence by Camden suggests that operators generally drill wells in "crooked hole country" with some type of packed hole assembly because it permits maximum weight to be run on the bit for faster rates of penetration. This does not mean, however, that continued use of a packed bottomhole assembly was the normal, prudent, and or practical choice beyond 12,550', where the partial directional survey established the extent of northwest drift in the interval from 9,050' to 12,550'. Camden's drilling expert testified that a packed bottomhole assembly will almost always hold angle, but not always direction. SWEPI's drilling expert testified that a packed bottomhole assembly is designed to hold both angle and direction. When a well has already drifted at an angle and in a direction that places the well closer to the lease line than allowed by the applicable spacing rule, *holding* angle and direction, without attempt to pursue alternatives that might reduce angle or bring the well back to a regular

location in conformity with its permit, is not considered by the examiners to be the most normal, prudent, and practical choice.

The drilling practices literature relied upon by Camden suggests that a pendulum bottomhole assembly is used as a corrective measure to reduce angle when deviation exceeds the maximum allowed. Camden's petroleum engineering expert testified that in the industry, it is generally expected that use of a pendulum bottomhole assembly will drop inclination angle. Camden's drilling expert testified that a pendulum bottomhole assembly is used to straighten a hole. Conceding Camden's point that its study of area wells does not show consistent results from use of a pendulum bottomhole assembly, and without claiming to know what the result would have been in the case of the Casas No. 1, the examiners nonetheless conclude that switching to a pendulum bottomhole assembly, after the results of the partial directional survey were known, would have been a prudent step for Camden to take.

In fact, the examiners are unable to determine from the evidence that Camden took any corrective action, after the results of the partial directional survey were known, to reduce angle of inclination or change direction of the Casas No. 1. It did not change the type of bottomhole assembly being used, even though it was an assembly designed to *hold* angle and direction. It did not change bits, continuing to use a PDC bit, which SWEPI's drilling expert described as a bit designed to drill straight ahead. It did not increase rotary speed or decrease weight on bit, which, in conjunction with use of a pendulum bottomhole assembly, would have been calculated to reduce angle and drill a straighter hole. Instead it continued to use the packed bottomhole assembly, and actually decreased RPM and increased weight on bit. It did not run a mud motor in the well to steer the well back in the direction of a regular location, even though the cost of directional tools and services would have been a small fraction of the total cost of drilling the well. Another operator successfully used a mud motor to directionally drill the Casas No. 2 on the same narrow lease to keep the well basically in the center of the lease at a regular location.

From a correlative rights perspective, the Casas No. 1 has had the same impact as if it had been drilled truly vertical from a surface location 80' from SWEPI's lease line without a Rule 37 exception. Camden is correct that prior to the time when the Casas No. 1 was drilled, it is likely that gas had been drained from the Casas Lease by surrounding wells, and the Casas family was entitled to drill a well to protect themselves against drainage. This does not mean, however, that they were entitled to have a well drilled to the current bottomhole or completion locations of the Casas No. 1 without obtaining a Rule 37 exception. Original gas in place beneath the Casas Lease was about 2.2 BCF, and the Casas No. 1 has produced about 7.0 BCF. A significant amount of the gas produced by the Casas No. 1 has come from surrounding leases.

In all the circumstances, the examiners conclude that the as-drilled bottomhole and completion locations of the Casas No. 1 are not reasonable within the meaning of Statewide Rule 11(c)(1)(A), and the well needs a Rule 37 exception permit if it is to continue to produce.

The Rule 37 Issues

Rule 37(m)(6)

The examiners disagree with, and decline to adopt, Camden's view that the Commission should grant a Rule 37 exception permit for the Casas No. 1 pursuant to the provisions of Rule 37(m)(6), even if the evidence shows that the granting of such an exception is not necessary to prevent waste or confiscation. In support of its position, Camden relies on the examiners' discussion in a 1982 proposal for decision in Rule 37 Case No. 92,049, *Application of Rhonda Operating Company for Rule 37 Exception to Drill Well No. 1 in the Mayfield Lease, Heluma East (Devonian) Field in Upton County, Texas* ("*Rhonda*") to the effect that what is now Rule 37(m)(6) "requires no finding of confiscation or waste."

The examiners are unaware of any subsequent contested case wherein the Commission has determined that a Rule 37 exception should be granted in the absence of a showing of the necessity of the exception to prevent confiscation or waste, and Camden has not cited one. But even if a finding of confiscation or waste is not essential to the Commission's authority to grant an exception under Rule 37(m)(6), the language of the rule and the examiners' discussion in *Rhonda* make it clear that the location for which the exception is granted must be *reasonable* within the meaning of Rule 11. Having concluded that the as-drilled bottomhole and completion locations of the Casas No. 1 are not reasonable under Rule 11, the examiners consider that Rule 37(m)(6) is simply inapplicable.

The Confiscation Issue

Confiscation is the denial to an owner or lessee of a fair chance to recover the oil or gas beneath his land or the equivalent in kind. *Railroad Commission v. De Bardeleben*, 305 S.W.2d 141, 143 (Tex. 1957); *Imperial American Resources Fund, Inc. v. Railroad Commission*, 557 S.W.2d 280, 286 (Tex. 1977); *Railroad Commission v. Williams*, 356 S.W.2d 131, 136 (Tex. 1962); *Gulf Land Co. v. Atlantic Refining Co.*, 131 S.W.2d 73, 80 (Tex. 1939).

An applicant requesting a Rule 37 exception based on confiscation must show: (1) it is not feasible for the applicant to recover his fair share of currently recoverable reserves from a well at any regular location; and (2) the proposed irregular location is reasonable and is necessary due to surface or subsurface conditions. Fair share is measured by the currently recoverable reserves beneath the applicant's tract.

Camden argues that a Rule 37 exception is necessary for the as-drilled bottomhole location of the Casas No. 1 because: (1) a regular location on the Casas Lease would encounter a thinner pay zone and lesser hydrocarbon pore volume than at the Casas No. 1 bottomhole location; and (2) in deposition testimony, SWEPI's expert in geology stated that seismic amplitude condemns most of the Casas Lease, and the amplitude that is there is insufficient to establish a well at a legal location.

Camden concedes that there is a regular location on the Casas Lease from which a well would encounter a productive area of the subject reservoir. Camden's expert in petroleum engineering estimated

that currently recoverable reserves in the reservoir beneath the Casas Lease are 245 MMCF. No Camden witness made the claim that a well at a regular location on the Casas Lease would not recover these reserves, or their equivalent in kind. SWEPI's "Z Sand Net Pay Isopach Map," which was relied upon by Camden, shows 24 feet of net pay in the subject reservoir at a regular location on the Casas Lease. Camden states correctly that SWEPI's Sg Phi h Isopach Maps show a degradation of hydrocarbon pore volume from northwest to southeast across the Casas Lease. However, the Sg Phi h isopach maps assign a value of 3.46 to a regular location on the Casas Lease, significantly better than the value assigned to the Casas No. 2 to the south or the Benavides No. 1 to southeast, and more than 50% of the value at the bottomhole location of the Casas No. 1 which has produced more than 7.0 BCF of gas.

Notwithstanding his earlier deposition testimony regarding low seismic amplitude at a legal location on the Casas Lease, SWEPI's expert in geology testified at the hearing that the Sg Phi h maps, on which both SWEPI and Camden appear to rely, show that a well at a regular location on the Casas Lease would allow Camden to recover the remaining recoverable hydrocarbons beneath the lease.

The examiners conclude that Camden did not prove that the granting of a Rule 37 exception for the as-drilled bottomhole location of the Casas No. 1 is necessary to prevent confiscation, because Camden did not show that it not feasible for Camden to recover its fair share of currently recoverable reserves from a well at a regular location.

The Waste Issue

If a substantial amount of hydrocarbons will be produced by the proposed Rule 37 well that otherwise would ultimately be lost, a permit to drill the well may be justified under Rule 37 to prevent waste. *Hawkins v. Texas Co.*, 209 S.W.2d 338, 343 (Tex. 1948). An applicant seeking an exception to Rule 37 based on waste must show that: (1) unusual conditions, different from conditions in adjacent parts of the field, exist under the tract for which the exception is sought; (2) as a result of these unusual conditions, hydrocarbons will be recovered by the well for which the exception is sought that would not be recovered by any existing well or by an additional well drilled at a regular location; and (3) the amount of otherwise unrecoverable hydrocarbons is substantial.

Camden contends the evidence shows that remaining recoverable gas that will be produced by the Casas No. 1 will be wasted unless a Rule 37 exception is granted for the as-drilled bottomhole location of the Casas No. 1, because the only other currently producing wells in the subject field cannot recover this gas. Camden asserts that it is not economically feasible to attempt to recover this gas from a regular location on the Casas Lease, because the cost to drill a new well, or the cost to sidetrack the Casas No. 1 to a regular location, would exceed the value of the remaining reserves that will be recovered if the Casas No. 1 is allowed to continue to produce. Camden also makes the argument that there is a rising water contact in the reservoir, the Casas No. 1 is higher structurally than the other producing wells in the field and likely to be the "last survivor," and if the Casas No. 1 is not allowed to continue to produce, "waste of the attic gas reserves will occur."

Camden's expert in petroleum engineering estimated that remaining recoverable reserves for the Casas No. 1 are 602 MMCF. Based primarily on his drainage area calculations, this expert expressed the opinion that the other two wells still producing from the field, the KWGU #3 and the LCWE GU #2, are not capable of recovering this 602 MMCF.

The examiners conclude that Camden did not prove that the granting of a Rule 37 exception for the as-drilled bottomhole location of the Casas No. 1 is necessary to prevent waste. First, Camden did not prove that there is any "unusual" subsurface condition in the reservoir that distinguishes the Casas Lease from adjacent parts of the field. A finding that "unusual conditions" exist is essential to a conclusion that a Rule 37 exception is necessary to prevent waste. *Hawkins v. Texas Company*, *supra* at pages 342-343; *Wrather v. Humble Oil & Refining Company*, 214 S.W.2d 112, 117 (Tex. 1948).

In *Exxon Corp. v. Railroad Commission*, 571 S.W.2d 497, 501 (Tex. 1978) ("*Exxon*"), the Court's opinion suggested that, in certain limited circumstances, an existing wellbore may be considered an "unusual condition." Camden has not expressly argued the "economic waste" theory of *Exxon*, but the assertion of its expert that it would not be economically feasible to drill a new well or sidetrack the Casas No. 1 to a regular location a suggests at least an *Exxon*-like thesis.

The "economic waste" theory of *Exxon* most often has been applied in cases where a well has been drilled and completed in good faith, and in conformity with applicable spacing rules, in a particular field, and later requires a Rule 37 exception for recompletion in a different field. The test set forth by the Court in *Exxon* for application of the "economic waste" theory is "whether the existing well was drilled and completed in the original formation legitimately and in good faith, and not as a subterfuge to bolster a later Rule 37 exception." Even where *Exxon* properly applies, proof that failure to grant a Rule 37 exception will result in the ultimate loss of hydrocarbons is essential.
Schlachter v. Railroad Comm'n of Texas, 825 S.W.2d 737, 740-741 (Tex. App.-Austin 1992, writ denied).

Exxon is not helpful to Camden in this case because it cannot be claimed that a well drilled in violation of Rule 37 was drilled "legitimately and in good faith." For the same reason, the existing wellbore of the Casas No. 1 cannot be claimed as an "unusual condition" to bootstrap an argument that a Rule 37 exception for the well is necessary to prevent waste.[3]

A second reason for the examiners' conclusion that Camden did not prove that the granting of a Rule 37 exception is necessary to prevent waste is the lack of probative evidence that the other producing

[3] While the examiners are persuaded that the "existing wellbore" and "economic waste" theories of *Exxon* do not apply, it is worthy of note that if it is true that the small amount of remaining recoverable reserves will not justify drilling a new well or sidetracking the Casas No. 1 to a regular location, a main reason is that from a location which the Commission has never permitted, the Casas No. 1 has withdrawn more than 7.0 BCF of gas from the reservoir, most of which appears to have come from surrounding leases.

wells in the field are not capable of producing the remaining recoverable reserves in the subject reservoir.[4] Available pressure data show good communication between wells in this field, and the evidence as a whole shows that the Casas No. 1, KWGU #3, and LCWE GU #2 are competing for the same reserves.

Camden attempted to support its position that the KWGU #3 and LCWE GU #2 are not capable of recovering the remaining reserves that will be recovered by the Casas No. 1 through drainage area calculations of its expert in petroleum engineering. Methodology used in these drainage area calculations make them less than convincing. For use in its drainage area calculations, Camden's expert constructed a plot of P/Z vs. cumulative production for the subject field. From this plot, he calculated current reservoir pressure for use in the drainage area calculations. The five pressures used in construction of the P/Z plot result in a straight line, as should be the case in a reliable P/Z plot. However, it appears that calculated G-1 pressures were used for the KWGU #2, LCWE GU #1, KWGU #3, and LCWE GU #3, whereas a measured bottomhole pressure more than 1,600 psi greater than the calculated G-1 pressure was used for the Casas No. 1. Consistent use of calculated G-1 pressures for the curve would not have resulted in a straight line.

Static bottomhole pressures were taken for the KWGU #2, LCWE GU #1, and KWGU #3 on April 21, 1999. The measured pressures ranged from a low of 11,453 psi in the LCWE GU #1 to 11,864 psi in the KWGU #3. These three pressures demonstrate very good communication throughout the field. Had Camden used the P/Z associated with the measured pressures from these three surveys in its P/Z plot, a fit on a straight line would not have resulted. The examiners conclude that the Camden P/Z plot is not reliable, even if used only to estimate current reservoir pressure.

The results of Camden's methodology for making its drainage area calculations appear to be demonstrably erroneous. For example, Camden calculated an ultimate drainage radius for the KWGU #2 of 1,439'. However, six months after the KWGU #2 was drilled and completed as the discovery well in the field, the LCWE GU #1 was drilled 2,000' away, and it came on with an initial pressure more than 500 psi lower than original reservoir pressure in the KWGU #2. This pressure depletion in the LCWE GU #1 suggests material error in Camden's calculation of an ultimate drainage area of only 1,439' for the KWGU #2. Conceding Camden's point that the KWGU #2 is no longer producing, the calculation of an erroneous ultimate drainage area for the KWGU #2 draws into question the validity of the remaining drainage area calculations, including those for the KWGU #3 and the LCWE GU #2, which are still producing.

Camden's argument that there is a rising water contact in the subject field that is likely to leave the Casas No. 1 as the "last survivor" in the field is simply not supported by the evidence. None of Camden's experts made this claim at the hearing. In fact, although the Casas No. 1 is the highest on structure of any of the wells still producing from the field, the testimony and exhibits of Camden's expert in petroleum engineering are to the effect that of the three wells that are still producing from the field, the well that is *lowest* on structure, the KWGU #3, will produce for the longest period of time. In addition, water yield

[4] Neither did Camden prove that a well drilled at a regular location on the Casas Lease, in combination with other producing wells, would not be capable of recovering the remaining recoverable reserves in the reservoir.

data from wells in the field do not provide any basis for concluding that there is a rising water contact of the type hypothesized by Camden in its closing statement. There is no evidence that any well drilled in the subject field has penetrated a water level. The Casas No. 1, which is structurally high, has a higher water yield than did the KWGU #2 which was drilled about 300' down dip from the highest structural position in the field. Even had Camden's hypothesis about a rising water contact and potential waste of attic gas been proven, the fact remains that there is a regular location on the Casas Lease that is structurally higher than the Casas No. 1.

Based on the record in this case, the examiners recommend adoption of the following Findings of Fact and Conclusions of Law.

FINDINGS OF FACT

1. At least ten (10) days notice was sent to all affected persons, who, for tracts closer to the proposed Rule 37 location than the greater of one-half (½) of the prescribed minimum between well spacing distance or the minimum lease line spacing distance, included the designated operator, all lessees of record for tracts that have no designated operator, and all owners of record of unleased mineral interests.

2. Camden Resources, Inc. ("Camden"), requests that the Commission determine that the as-drilled bottomhole and completion locations of the Casas Lease, Well No. 1, Rosita, E. (Wilcox Cons.) Field, Duval County, Texas ("Casas No. 1"), are reasonable and that a new permit for the well is not required pursuant to Statewide Rule 11(c)(1)(A).

3. Camden also seeks an exception to Statewide Rule 37 for the as-drilled bottomhole location of its Casas No. 1.

4. Camden's application and request are protested by SWEPI L.P. ("SWEPI"), an operator of tracts, as here pertinent, to the west and north of the Casas Lease, and by KLT Gas, Inc. ("KLT"), a non-operating working interest partner of SWEPI.

5. The discovery date for the Rosita, E. (Wilcox Cons.) Field is December 4, 1997. Field rules for the subject field provide for 467' lease line and 933' between well spacing.

6. The Casas No. 1 was permitted at a regular location 475' from the west line and 473' from the east line of the 81-acre Casas Lease. The well was spudded at this surface location by Camden during the third week of January 2001, and was completed on April 2, 2001.

7. Original gas in place beneath the Casas Lease was about 2.2 BCF. Cumulative gas production for the Casas No. 1 is about 7.0 BCF.

8. In November 2001, the Commission held a hearing regarding the Casas No. 1 in Oil & Gas Docket Nos. 04-0229075 and 04-0229076. At this time, the bottomhole and completion

locations of the Casas No. 1 were not known.

9. On May 9, 2002, the Commission issued final orders in Oil & Gas Docket Nos. 04-0229075 and 04-0229076, and based on facts disclosed at the November 2001 hearing, the Commission found in the final orders that maximum displacement of the Casas No. 1 indicated by inclination surveys was less than the distance from the surface location of the well to the nearest lease line. The Commission thus concluded that no probable cause had been shown to suspect that the Casas No. 1 was not bottomed within the boundaries of the Casas Lease, Camden was not required to run a directional survey under Statewide Rule 11(c), the Casas No. 1 was drilled in compliance with Statewide Rules 11 and 37, and the Casas No. 1 should be assigned an allowable effective May 25, 2001.

10. On August 6, 2003, in Cause No. DC-00-344, *Arnoldo Casas Et Al. v. SWEPI L.P. and Shell Western E & P, Inc.*, the Judge of the 229th District Court in Duval County, Texas, ordered that SWEPI be permitted to run a directional survey on the Casas No. 1.

11. Facts and conditions have changed since issuance of the Commission's final orders in Oil & Gas Docket Nos. 04-0229075 and 04-0229076. On August 21, 2003, a directional survey was run on the Casas No. 1 at the direction of Camden. On September 4, 2003, another directional survey was run on the Casas No. 1 at the direction of SWEPI. These directional surveys established, for the first time, the bottomhole and completion locations of the Casas No. 1, as well as the angle and compass direction of wellbore drift from surface to total depth.

12. The bottomhole location of the Casas No. 1 is 80' from the west line and 390' from the north line of the Casas Lease. The top of the subject formation in the Casas No. 1 at a depth of 15,826' is 112' from the west line and 422' from the north line of the Casas Lease. The bottom of the formation in the Casas No. 1 at a depth of 15,930' is 108' from the west line and 419' from the north line of the Casas Lease.

13. Camden did not drill the Casas No. 1 as nearly vertical as possible by normal, prudent, and practical drilling operations, and the bottomhole and completion locations of the Casas No. 1 are not reasonable.

    (a) The bottomhole of the well is 395' closer to the west line of the Casas Lease than is the well's permitted surface location. The top of the formation in the well is 363' closer to the west line of the Casas Lease than is the well's permitted surface location. The bottom of the formation in the well is 367' closer to the west line of the Casas Lease than is the well's permitted surface location.

    (b) The well was drilled to bottomhole and completion locations which are about 75% or more of the distance from the well's permitted surface location to the west line of the Casas Lease.

    (c) The Casas Lease is about 980' wide from east to west, and there is a 46' "window" of

regular locations in the center of the lease from east to west.

(d) Beneath the Casas Lease, below a depth of about 8,000', beds in the formation have steep east dip. When drilling through these beds, the drilling bit tends to walk up dip. Most area wells have shown a tendency to drift to the northwest.

(e) In 2003, Kebo Oil & Gas, Inc., directionally drilled the Casas No. 2 well on the same Casas Lease, and used a mud motor to steer the well to a bottomhole location basically in the center of the lease.

(f) At the depth of the Casas No. 1, an average inclination angle of no more than 1.6 degrees over the entire length of the wellbore was required to keep the bottomhole on the Casas Lease.

(g) Prior to drilling the Casas No. 1, Camden purchased and analyzed seismic data which disclosed steep east dip of beds above the target "Z Sand" in the formation beneath the Casas Lease.

(h) The seismic data analyzed by Camden prior to drilling the Casas No. 1 disclosed that a well drilled to bottomhole and completion locations directly beneath the permitted surface location of the well would encounter productive reservoir, but not as productive as a completion location in the northwest corner of the Casas Lease where seismic amplitude indicated better reservoir quality.

(i) While the Casas No. 1 was being drilled, inclination surveys down to a depth of 9,000' showed that at that depth, the well had accumulative displacement of 94.392'. At 9,050', a partial directional survey was run, in the interval between 9,050' and 12,550'. The partial directional survey showed that in the interval between 9,050' and 12,550', the well had drifted 76.65' north and 114.75' west. The inclination survey at 9,000' showed an angle of 2.0 degrees, and the angle at the first survey point on the partial directional survey at 9,050' was 2.8 degrees. At 12,550', Camden had an inclination survey reading of 1.7 degrees.

(j) After the partial directional survey had been run, Camden knew that at a depth of 12,550', regardless of the compass direction of the 94.392' of displacement down to 9,000', the well already had drifted closer to the west line of the Casas Lease than allowed under the applicable 467' lease line spacing rule.

(k) At a depth of 12,550', Camden had another 4,300' to drill in order to reach total depth of the well.

(l) After the partial directional survey had been run, Camden did not take corrective action to reduce angle of inclination or to turn the well back to a location beneath the well's permitted surface location.

(i) At this point, Camden's objective was to keep accumulative displacement such that the well would be bottomed somewhere on the Casas Lease, so that Camden would not be required to run a complete directional survey disclosing the bottomhole location pursuant to Statewide Rule 11.

(ii) Camden drilled the well from surface to total depth by use of a packed bottomhole assembly. It continued to drill with a packed bottomhole assembly after the partial directional survey run in the interval from 9,050' to 12,550' disclosed northwest drift. A packed bottomhole assembly is designed to hold angle and direction.

(iii) Camden did not run a mud motor in the well to steer the well back in the direction of a regular location. The cost of directional tools and services would have constituted a small fraction of the total cost to drill the well.

(iv) Camden did not switch to use of a pendulum bottomhole assembly. Although not always effective for this purpose, a pendulum bottomhole assembly is generally considered in the industry as effective to reduce inclination angle and straighten a hole.

(v) Camden did not change the drilling bit. The PDC drilling bit which Camden used is designed to drill straight ahead.

(vi) Camden did not increase RPM or reduce weight on bit, which, in conjunction with a pendulum bottomhole assembly, would have been calculated to reduce angle and drill a straighter hole.

(m) Camden had access to torque and drag data that should have indicated that the well was not turning back beneath the surface location.

(n) The Casas No. 1 began its drift to the northwest almost from the start of drilling operations. After the running of the partial directional survey in the interval from 9,050' to 12,550', the well held direction and angle actually increased.

14. Camden did not prove that a well at a regular location on the Casas Lease will not afford Camden an opportunity to recover its fair share of currently recoverable reserves.

(a) Currently recoverable reserves in the subject reservoir beneath the Casas Lease are in the amount of 245 MMCF.

(b) There are regular locations in the center of the Casas Lease from east to west from which a well would encounter a productive area of the subject reservoir.

(c) There are 24' of net pay in the subject reservoir at a regular location on the Casas Lease.

(d) The subject reservoir beneath a regular location on the Casas Lease has hydrocarbon pore volume value on "Sg Phi h Isopach Maps" better than some surrounding wells to the south and southeast and more than 50% of the hydrocarbon pore volume value at the as-drilled bottomhole location of the Casas No. 1, which has produced more than 7.0 BCF of gas.

(e) No Camden witness made the claim that a well at a regular location on the Casas Lease would not be capable of recovering the currently recoverable reserves in the subject field beneath the Casas Lease.

15. Camden did not prove that there are any unusual conditions in the reservoir beneath the Casas Lease different from conditions in adjacent parts of the field.

16. Camden did not prove that any hydrocarbons ultimately will be lost if the Casas No. 1 is not allowed to continue to produce at its as-drilled bottomhole and completion locations.

(a) Estimated remaining recoverable reserves for the Casas No. 1 are in the amount of 602 MMCF.

(b) The KWGU #3, approximately 2,650' southwest of the Casas No. 1 as-drilled bottomhole location, and the LCWE GU #2, approximately 1,525' northeast of the Casas No. 1 as-drilled bottomhole location, are currently producing from the subject field.

(c) There is good pressure communication between wells in the subject field.

(d) Initial pressure in the Casas No. 1 was depleted by more than 4,000 psi from original reservoir pressure, indicating that other wells in the field , including the KWGU #2 and KWGU #3, had already been producing gas from the same area of the reservoir from which the Casas No. 1 began producing.

(e) The Casas No. 1, KWGU #3 and LCWE GU #2 compete for the same reserves.

(f) Remaining recoverable gas in the subject field is in the amount of only about 1,761 MMCF.

(g) Camden did not prove that the KWGU #3 and LCWE GU #2 are not capable of producing the remaining recoverable hydrocarbons in the subject field.

(h) Camden's drainage area calculations for the KWGU #3 and LCWE GU #2, and other wells that have been carried in the subject field, were not shown to be reliable.

(i) The drainage area calculations used estimated current reservoir pressure taken from a plot of P/Z vs. cumulative production extrapolated down to an abandonment pressure of 5,000 psi.

(ii) Use of well pressures in constructing the P/Z plot was not consistent. For all wells except the Casas No. 1, calculated G-1 pressures were used. For the Casas No. 1, a measured bottom hole pressure more than 1,600 psi greater than the calculated G-1 pressure was used. Consistent use of calculated G-1 pressures would not have plotted a straight

line on the P/Z plot.

(iii) Static bottomhole pressures measured on April 21, 1999, in the KWGU #2, LCWE GU #1, and KWGU #3, if used on Camden's P/Z plot would not fit on a straight line on the P/Z plot.

(iv) Camden's P/Z plot extrapolates to gas in place for all wells in the field of 95 BCF, and there are only 54 BCF in the reservoir. Camden's drainage area calculations used an abandonment pressure of 5,000 psi. Abandonment pressure estimated from the P/Z plot, on which Camden relies for current reservoir pressure, using the field EUR of 31.85 BCF, is about 6,200 psi.

(v) Six months after the KWGU #2 was drilled as the discovery well for the subject field, the LCWE GU #1 was drilled 2,000' away and came on with initial pressure depleted by more than 500 psi from original reservoir pressure, tending to demonstrate that Camden's calculated ultimate drainage radius of only 1,439' for the KWGU #2 is erroneous.

(i) Camden did not prove that a well drilled at a regular location on the Casas Lease would not be capable of recovering the estimated 602 MMCF of remaining recoverable reserves that will be recovered by the Casas No. 1 if it is allowed to continue to produce.

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. This proceeding does not constitute an impermissible collateral attack on the Commission's final orders in Oil & Gas Docket Nos. 04-0229075 and 04-0229076.

4. The Commission is not barred from concluding that the Casas No. 1 was not drilled in compliance with Statewide Rules 11 and 37, or from concluding that the Casas No. 1 requires a new permit, by the Commission's final orders in Oil & Gas Docket Nos. 04-0229075 and 04-0229076 under the doctrine of *res judicata.*

(a) This proceeding involves different issues than those decided by the Commission's final orders in Oil & Gas Docket Nos. 04-0229075 and 04-0229076.

(b) Facts and conditions have changed and/or new facts have become known since the

issuance of the Commission's final orders in Oil & Gas Docket Nos. 04-0229075 and 04-0229076.

(c) Conclusions in the Commission's final orders in Oil & Gas Docket Nos. 04-0229075 and 04-0229076 that the Casas No. 1 was drilled in compliance with Statewide Rules 11 and 37 were purely collateral to the main issues involved in these prior dockets and were not necessary to adjudication of these prior dockets.

5. The Casas No. 1 was not drilled in compliance with Statewide Rule 11.

6. The as-drilled bottomhole and completion locations of the Casas No. 1 are not reasonable under Statewide Rule 11(c)(1)(A).

7. The Casas No. 1 was not permitted or drilled in compliance with Statewide Rule 37.

8. A new permit under the provisions of Statewide Rule 37 is required for the as-drilled bottomhole location of the Casas No. 1 pursuant to Statewide Rule 11(c)(1)(A).

9. The Casas No. 1 is not entitled to a Rule 37 exception permit pursuant to the provisions of Statewide Rule 37((m)(6).

10. Camden did not prove that a Rule 37 exception permit for the as-drilled bottomhole location of the Casas No. 1 is necessary to protect correlative rights or prevent confiscation.

11. Camden did not prove that a Rule 37 exception permit for the as-drilled bottomhole location of the Casas No. 1 is necessary to prevent waste of hydrocarbons.

12. The application of Camden for a Rule 37 exception permit for the as-drilled bottomhole location of the Casas No. 1 should be denied.

13. The Casas No. 1 should be ordered shut-in.

RECOMMENDATION

The examiners recommend adoption of the attached final order denying the application of Camden Resources, Inc., for a Rule 37 exception for the as-drilled bottomhole location of the Casas No. 1 and ordering that the Casas No. 1 be shut-in.

Respectfully submitted,

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Hearings Examiner

Donna Chandler
Technical Examiner

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