

**KELLAHIN & KELLAHIN
ATTORNEY AT LAW**

W. THOMAS KELLAHIN
NEW MEXICO BOARD OF LEGAL
SPECIALIZATION RECOGNIZED SPECIALIST
IN THE AREA OF NATURAL RESOURCES-
OIL AND GAS LAW

P.O. Box 2265
SANTA FE, NEW MEXICO 87504
117 NORTH GUADALUPE
SANTA FE, NEW MEXICO 87501

TELEPHONE 505-982-4285
FACSIMILE 505-982-2047
TKELLAHIN@AOL.COM

November 8, 2002

Ms. Lori Wrotenbery, Chairman
Ms. Jamie Bailey, Member
Dr. Robert Lee, Member
Oil Conservation Commission
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

Hand Delivery
Hand Delivery
Federal Express

Re: Redrock Operating LTD, Co.'s Closing Statement

NMOCD Case: 12622 (De Novo)
Application of Nearburg Exploration Company, LLC
for two non-standard gas spacing and proration units,
Lea County, New Mexico

NMOCD Case 12908 (DeNovo)
Division Nomenclature Case
Lea County, New Mexico

Dear Members of the Commission:

On behalf of Redrock Operating LTD, Co. and in accordance with the Commission's instructions at the conclusion of the hearing on September 22, 2002, please find enclosed Redrock's Closing Statement

Very truly yours,



W. Thomas Kellahin

cc: Steve Ross, Esq.
Attorney for the Commission
William F. Carr, Esq.,
Attorney for Nearburg
J. Scott Hall, Esq.
Attorney for Raptor

RECEIVED
OCT 22 2002
10:30 AM

**STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES
DEPARTMENT
OIL CONSERVATION COMMISSION**

**IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION FOR THE PURPOSES OF
CONSIDERING:**

**CASE NO. 12622 (De Novo)
ORDER NO. R-11768**

**APPLICATION OF NEARBURG EXPLORATION
COMPANY, L.L.C. FOR TWO NON-STANDARD
GAS SPACING AND PORRATION UNITS
LEA COUNTY, NEW MEXICO**

**CASE NO. 12908-A
(Severed and Reopened)
ORDER R-11818**

**APPLICATION OF THE OIL CONSERVATION
DIVISON FOR AN ORDER CREATING
CONTRACTING, REDESIGNATING, AND
EXTENDING VERTICAL AND HORIZONTAL
LMITS OF CERTAIN POOLS IN LEA COUNTY
NEW MEXICO**

REDROCK'S CLOSING STATEMENT

In accordance with the directions of the New Mexico Oil Conservation Commission, Redrock Operating Ltd, Co. ("Redrock"), submits the following closing statement for the hearing held on October 21-22, 2002:

Introduction:

Redrock reserved a 10% ORR in the S/2 of Section 34 **before** the State of New Mexico issued an oil & gas lease for the N/2 of Section 34 on January 1, 2000 to Great Western who, in turn, assigned the lease and transferred operations to Nearburg. **See Commission Transcript p 268 Redrock Exhibit A-10**

On March 7, 2000, Nearburg spudded the Nearburg well in the NE/4 of Section 34 that was completed on June 7, 2000 and commenced producing the well at a rate of approximately 2 MMFCPD. **See Commission Transcript p 268 Redrock Exhibit A-1**

On January 8, 2001 Nearburg filed an application with the Division seeking approval of two 160-acre non-standard spacing units including the NE/4 of Section 34 for its Grama Ridge East "34" State #1 well (the "Nearburg well") located in the NE/4. **See Commission Transcript p 268 Redrock Exhibit A-14**

By July 27, 2001, when the Division ordered the well to be shut-in, the Nearburg well had produced about 1 Bcf of gas, which was enough gas and revenues to repay Nearburg and the other working interest owners in the N/2 all of the costs of drilling and completing the well, and paid proceeds to all of the working interest owners, royalty and ORR owners in the N/2 of Section 34. **See Commission Transcript p 268 Redrock Exhibit A-21**

If the E/2 of Section 34 is dedicated to the Nearburg well, Nearburg and its partners will still own 100% of the working interest in the well but Redrock will have a 5% ORR and be entitled to an estimated \$310,000 attributable to past production. **Calculated from statement of James Brown, Commission Transcript p. 404**

Redrock has expended substantial time and expense to protect its correlative rights in the SE/4 and defend itself against drainage from Nearburg who holds 100% of the leasehold rights as to the entirety of Section 34 and stands to gain economically by excluding Redrock from their share of production.

Ultimate Issue:

Was the Division Examiner correct when he denied Nearburg's application because there was insufficient evidence to support Nearburg's contentions about the size, shape and orientation of the GRE Morrow sand stringer being produced by the Nearburg Well to show that the SE/4 does not contribute recoverable hydrocarbons in this interval, and found that it is probable that the SE/4 of Section 34 is contributing recoverable hydrocarbons in this interval even under Nearburg's conservative estimates of ultimate recovery? **See Commission Transcript p 268 Redrock Exhibits A-21**

In order to decide this ultimate issue and overrule the Division Examiner, the Commission must do all of the following:

The Mud Log

A. The Commission must be convinced that the GRE sand being produced in the Nearburg well does not extend into the SE/4 of Section 34, and agree that:

(1) Nearburg can ignore the mud log and Gamma Ray log on the Llano 34-1 well and honor only the **gross porosity** log data that Nearburg chose to acknowledge in preparing their **gross** pay ispoach of the GRE sand; and

(2) that Nearburg can ignore the mud log on the Llano 34-1 well and honor only the **net porosity** log data that they chose to acknowledge in preparing their **net** pay ispoach of the GRE sand.

B. The Commission must reject Redrock's conclusions that the mud log for the Llano 34-1 well (**Redrock Exhibit B-9, Commission Transcript pp. 294-301**) proves that the GRE sand extends into the SE/4 of Section 34

C. The Commission must ignore all of the following:

1. That the Mud Log indicates that the GRE sand is present in the Llano 34 Well because:
 - i. the drilling rate increases from a rate of 36 min/feet to a rate of 10 min/feet ("drilling break") through the GRE sand indicating porosity that cannot be measured on the porosity log.
 - ii. this drilling break is similar to the drilling break observed in the Lower Morrow "B" sand which produced over 4 BCFG.
 - iii. the lithology column of the Mud Log indicates that the samples taken correlative to the GRE sand interval are in fact sand and not shale.
 - iv. the sample in the area of the GRE sand indicates that there is visual porosity and that the porosity is similar to the observed porosity in the Lower Morrow "B" sand.
 - v. the chromatograph portion of the mud log indicates the presence of gas in the mud interval drilled that correlates to the GRE sand and an increase of the flare to 3'-4' as the GRE sand is drilled.
 - vi. the chromatograph response of the GRE sand is better than the chromatograph response of the Lower Morrow "B" sand that produced over 4 BCFG.

2. Reject Redrock's geology that utilized the data from the mud log and concluded that it indicates that the GRE sand net pay is close to the well bore, if not in the Llano well.

The fault

D. The Commission must be convinced that the fault separating the E/2 from the W/2 of Section 34 does not exist despite the following evidence:

- (a) That Nearburg admits in its Geological Summary, dated July 31, 2002 and prepared after the Nearburg Well was completed, that this fault exists:
"Structure mapping of the Morrow in this area **does** indicate the presence of a fault between the Nearburg Grama Ridge East "34" #1 well and the GRM Unit #2 well." **See Commission Transcript p. 144 Redrock Exhibit E-2**
- (b) That Nearburg shows this fault on its structure map prepared by its Geologist, Ted Gawloski, dated May of 2000, under the supervision of Dean Horning and prepared **after** the Nearburg well was drilled and logged. (See **Redrock Exhibit E-3) Commission Transcript p 145**
- (c) That Nearburg again shows this fault on its structural cross-section map prepared by it Geologist, Ted Gawloski, dated May of 2000, under the supervision of Dean Horning and prepared **after** the Nearburg well was drilled and logged. (See **Redrock Exhibit E-4) Commission Transcript p 153**

Structure Map

E. The Commission must reject Redrock's Structure Map that concludes that there is a fault between the E/2 and W/2 of Section 34.

See Commission Transcript p 279 Redrock Exhibits B-2)

F. The Commission must ignore the anomaly in Section 27 depicting an inter-regional dip that indicates a fault in Section 34.

G. The Commission must reject Redrock's Structural Cross Section map that demonstrates:

(a) the existence of a fault through Section 34.

(b) that the main Morrow B sand in the Nearburg well in the E/2 calculates wet and is up dip to the GRM Unit Well # 2 in the W/2 that was completed in the Main Morrow "B" interval, as was further demonstrated by Nearburg's own Geologist, Ted Gawloski, in the OCD hearing before Examiner Stogner.

(See) Commission Transcript pp 279, 281 Redrock Exhibit B-1 and B-2

Original Gas in Place

I. The Commission must find that the deletion of the fault does not affect Nearburg's calculation of the original gas in place in the GRE sand of the Nearburg well.

J. That the Nearburg Well exclusively drains only the NE/4 160-acre non-standard gas spacing unit proposed by Nearburg despite testimony by Redrock and Nearburg to the contrary. **See Redrock Exhibits D-1** (indicating 262 acres) and **Nearburg Exhibit 21** (indicating 201 acres).

RFT data

K. The Commission must accept Nearburg's contention that the **only** explanation for the pressure depletion indicated by the RFT log in the Morrow B sand at -12,892' to -12,902' in the Llano 34#1 well is that the well was being drained from production in the GRM Unit Well No 2 located on the opposite side of the fault from the Llano well in the E/2 of Section 34, and eliminate the possibility that production from any other storage wells included in the storage unit on the same side of the fault could have caused the depletion.

L. The Commission must accept Nearburg's argument that:

(1) The Commission must accept Nearburg's contention that the RFT log for the Llano 34#1 Well in the Main Morrow B sand from -12,985' to -13,048' definitively indicates that there is no fault present as correlated to the GRM Unit #2 well perforated in that same interval, although the RFT shows that the RFT pressure taken from that zone indicates virgin pressure in all but one zone despite the production from that interval from the GRM Unit Well #2 on the other side of the fault; and

(2) that there is no other alternative explanation that other wells could have depleted that zone. **See Commission Transcript p22, 294 Redrock Exhibit E-9**

Orientation of GRE sand pod

M. The Commission must be convinced that Nearburg is correct that the GRE sand:

(1) is a deltaic marine based sand depositional environment orientated West to East in the N/2 of Section 34.

(2) while all other sands in the Morrow B are non-marine based sand in a depositional environment orientated North-South.

N. The Commission must revise their Finding (11) of Order R-11611 to show that the geology described by Raptor and now confirmed by Redrock is incorrect.

O. The Commission must reject Redrock's geological interpretation of the size, shape and orientation of the GRE sand, which shows that:

(i) by using **all** of the data points available, and contrary to Nearburg's geological limited use of all data points, the depositional orientation of the GRE sand stringer is from North to South. **See Commission Transcript p 271 Redrock Exhibit B-4**

(ii) and accept Nearburg's geological interpretation, which excludes all the data available for the Llano 34 well, that the GRE sand is oriented East-West.

(See Commission Transcript p 116 Nearburg Exhibit 9)

W/2 Spacing Unit

P. The Commission must void the W/2 spacing unit for the Grama Ridge Unit Well No. 2 despite the fact that Nearbug admitted in its January 8, 2001 application in this case that that spacing unit was still in effect (See **Commission Transcript p 116 Nearburg Exhibit 9**).

Q. The Commission must terminate the W/2 spacing unit so that Nearburg can now dedicate the N/2 of Section 34 to its well despite the fact that there is no land reason, State Land Office rule or Division rules that prevents Nearburg from dedicating the E/2 of Section 34 to the well.

R. Despite the fact that all other operators prior to Nearburg could not test the GRE sand in the Llano 34 well because of downhole mechanical problems, the Commission must accept Nearburg's contention that they plugged the Llano well because it was absolutely non-productive and not due to the downhole conditions.

Change Pool Boundary

S: The Commission must reverse Division Order R-5995, **Redrock Exhibit A-5**, which held that:

1. while the Grama Ridge Gas Storage Unit included all of Section 34, as well as other acreage, the well in the E/2 of Section 34 was fault separated from the gas storage's Morrow formations in the W/2 of Section 34. See Finding (6)
2. the productive limits of the gas storage pool are limited to the W/2 of Section 34, and other acreage, because of the fault between the W/2 and E/2 of Section 34. See Finding (8)

Sapient Case

T. The Commission must reject its recent decision in the Sapient case. Order No. R-11652-B, dated March 26, 2002 in Case 12587 and Case 12605 heard on December 4, 2001, **copy enclosed**

U. The Commission, in approving the Nearburg case, must overrule its precedent established in the Sapient case in which Sapient attempted to do what Nearburg now seeks to accomplish.

V. The Commission must reject its order in the Sapient case (R-11652-B), which:

1. denied Sapient's request to divide a standard 160-acre spacing unit for a Tubb Gas well in the Tubb formation so that the E/2 of the quarter-section would be dedicated to the well and the W/2 owners would have to drill another well.

2. held that the evidence supported a conclusion that a standard 160-acre spacing unit was appropriate for the Sapient well because it drained more than the unit requested by the applicant.

The Morrow Precedent

W. By approving the Nearburg application, the Commission will have done the following:

- (1) Established a precedent whereby an operator of a Morrow gas well can, after it drills and produced 1 BGf of gas, come before you and obtain an exception from Rule 104 for a 160-acre non-standard unit or move a pool boundary so that this spacing unit is all in one pool.
- (2) Disregarded the correlative rights of an ORR owner who owned its interest before the Nearburg well was drilled and allow Nearburg to configure a spacing unit after the well has been drilled and produced to serve their own self interests.
- (3) Created the opportunity for an Operator to alter established spacing units or alter orientations when ownership changes within the section.
- (4) Established a precedent to allow all Operators the ability to carve out a single Morrow stringer and rule on it separately from the traditional existing and future Morrow Units, thereby administering the Morrow Sand as a collection of separate and distinct reservoir Units with varying orientation and size throughout the Morrow rather than a single defined pool.

Carr's closing for Conoco against Sapient

Examiner Transcript:

William F. Carr:

“ we can stand here and point fingers at who should have done what and how this might of played out differently,..”

But the bottom line is, “we’ve got a problem”

“We suggest that we would have to form a standard unit, share the production from that well with the interest owners in a standard spacing unit and they, for obvious reasons, don’t want to do that”

“We believe that we are the owners of the acreage and the reserves that ultimately will be drained by this well and therefore we have a right and should be included in the standard unit”

“And if we could get back to the rules as close as possible on spacing, spacing would follow drainage and the unit should be standard and we should share”

“And to avoid sharing the production, Sapient seeks approval of a nonstandard spacing unit”

“We believe the way to resolve this matter is to deny the application and shut in the Sapient well until they form a standard unit”

That was part of Mr. Carr's closing argument for Conoco in the Sapient case and is also Redrock's argument in the Nearburg case:

CONCLUSIONS

Why did Nearburg keep changing its maps

Nearburg has changed their geological interpretation and testimony depending on their audience and their economic goals at different times. Nearburg showed to LG&E (the Grama Ridge Storage Unit Operator at the time) their geological position and maps that had a fault between the E/2 and the W/2 of Section 34 in the GRE sand interval to convince LG&E that there was sufficient protection for the gas storage unit regarding drainage from the Nearburg well. Now Nearburg shows the Commission a dubious geological interpretation that mysteriously deletes the fault to meet Nearburg's current plan to form a spacing unit consisting of the N/2 or the NE/4 of Section 34 simply to deny Redrock their just share of production.

As Mr., Stogner found in the Examiner order: "(11) There is **insufficient evidence** to support Nearburg's contentions about the size, shape and orientation of this producing interval to show that the SE/4 does not contribute recoverable hydrocarbons in this interval," and in Finding 10(f) "..... it is probable that the SE/4 of Section 34 is contributing recoverable hydrocarbons in this interval **even under Nearburg's conservative estimates of ultimate recovery.**"

This still the case and the Commission should **deny** this application and keep the well shut until Nearburg dedicates the E/2 of Section 34 to its well.

Nearburg's negligence:

Nearburg's position, as evidenced by the testimony of their own ORR owner James E. Brown, is that the State Land Office and the Division created all the problems surrounding the issuance of the N/2 lease and the proposed N/2 unit overlapping of two different pools, when in fact it was Nearburg's own negligence that placed them in this situation. Nearburg now comes before the Commission in an attempt to **use the Commissioners jurisdiction and authority** to form a precedent setting unit configuration, deny Redrock of their rightful share of production and proceeds from the Nearburg well, and relieve Nearburg

from the consequences resulting from their own inadequate land due-diligence methodologies. **To allow this would be a violation of Redrock's correlative rights.**

The Division orders and the State Land Office procedures are not hard to find. They are all in the public record and Nearburg could have found them but failed to make the most basic search required of any competent Operator to see if the N/2 of Section 34 was available for a spacing unit.

Summary

1. As proven by the technical aspects of the evidence, the necessity of and the appropriate Morrow Gas Spacing unit for the Nearburg well is an E/2, 320-acre stand up configuration in order to protect correlative rights, prevent waste and the drilling of unnecessary wells
2. All past and future Morrow production from the Nearburg well should be allocated to the owners in the E/2, 320-acre stand up unit configuration
3. Nearburg should be required to immediately proceed with all necessary approvals in order to formalize the E/2 Morrow unit and complete the process with all dispatch.
4. The Nearburg well should remain shut-in until all appropriate approvals are obtained for the E/2 Morrow unit, accounting allocations are completed to reconcile with the owners of the E/2 unit for past and future production and all proceeds paid to all owners including, but not limited to, Redrock.

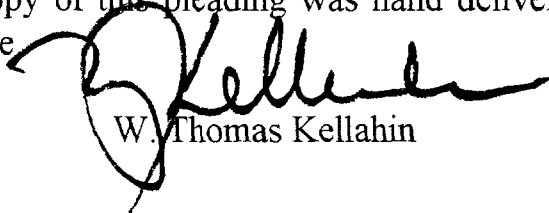
Respectfully submitted:

A handwritten signature in black ink, appearing to read 'W. Thomas Kellahin', written over a horizontal line.

W. Thomas Kellahin, Esq.
Attorney for Redrock Operating Ltd, Co

CERTIFICATE OF SERVICE

W. Thomas Kellahin hereby certifies that on November 11, 2002, a true and correct copy of this pleading was hand delivered to all counsel of record in this case.



W. Thomas Kellahin

**STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION**

**IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION FOR THE PURPOSE OF
CONSIDERING:**

CASE NO. 12587

**THE AMENDED APPLICATION OF SAPIENT ENERGY CORPORATION FOR
AN UNORTHODOX WELL LOCATION AND (i) TWO NON-STANDARD 160-
ACRE SPACING UNITS OR, IN THE ALTERNATIVE, (ii) ONE NON-
STANDARD 160-ACRE SPACING AND PRORATION UNIT, LEA COUNTY,
NEW MEXICO,**

AND

CASE NO. 12605

**THE APPLICATION OF SAPIENT ENERGY CORPORATION FOR SPECIAL
POOL RULES, LEA COUNTY, NEW MEXICO,**

ORDER NO. R-11652-B

ORDER OF THE NEW MEXICO OIL CONSERVATION COMMISSION

BY THE COMMISSION:

This case came before the Oil Conservation Commission (hereinafter referred to as "the Commission") on December 4, 2001 at Santa Fe, New Mexico, and the Commission, having carefully considered the evidence, the pleadings and other materials submitted by the parties hereto, now, on this 26th day of March, 2002,

FINDS,

1. Notice has been given of the application and the hearing on this matter, and the Commission has jurisdiction of the parties and the subject matter herein.
2. In Case No. 12587, Sapient Energy Corporation (hereinafter referred to as "Sapient") seeks approval of an unorthodox gas well location for its Bertha J. Barber Well No. 12 (hereinafter referred to as "the Barber 12 well"), located 330 feet from the North line and 660 feet from the East line of Section 7, Township 20 South, Range 37 East, NMPM. Sapient proposes to dedicate the Barber 12 well to a non-standard 80-acre gas spacing unit consisting solely of its acreage in the E/2 of the NE/4 of Section 7, create another spacing unit in the W/2 of the NE/4, and produce natural gas from the West

Monument-Tubb Gas Pool. Sapiant requests that the Commission's approval of the non-standard unit be retroactive to September 9, 1999, the date of first production.

3. In Case No. 12605, Sapiant seeks special pool rules for the West Monument-Tubb Gas Pool identical to existing rules in the Monument Tubb Oil Pool, including standard 80-acre spacing units and a 330-foot set back requirement for both oil and gas wells.

4. Sapiant's requests are opposed by Chevron U.S.A. Production Company (hereinafter referred to as "Chevron") and Conoco Inc. (hereinafter referred to as "Conoco").

5. The Commission conducted an evidentiary hearing on December 4, 2001 on the applications of Sapiant, heard testimony from witnesses called by Sapiant and jointly by Chevron and Conoco (hereinafter referred to collectively as "Chevron/Conoco") and accepted for the record exhibits presented by both parties during the hearing. The Commission also accepted pre-hearing statements and closing statements.

6. Sapiant argued during the hearing that the evidence establishes that the Barber 12 well is capable of draining 53 to 60 to at most 80 acres. Sapiant argues its contention is supported by its material balance calculations and production decline analysis.

7. Sapiant argued that its geologic evaluation of the Tubb reservoir supports a finding that the West Monument-Tubb Gas Pool, in which the Barber 12 well is located, should be treated similarly for purposes of spacing and well location as the adjoining Monument Tubb Oil Pool. Sapiant claims its geologic evidence demonstrates that the West Monument-Tubb Gas Pool is an extension of the same Tubb gas/oil accumulation, that the Barber 12 well has identical producing attributes as gas wells in the Monument Tubb Oil Pool, and that a continuous geologic correlation exists from the Barber 12 well east across the Monument Tubb Oil Pool.

8. Sapiant argued that establishment of a 160-acre unit would leave 70% of the gas in place in the W/2 NE/4 necessitating an additional well in Section 7.

9. Sapiant further argued that the evidence established that it is both reasonable and practicable to adopt 80-acre spacing units consisting of the E/2 NE/4 and the W/2 NE/4 of Section 7. Sapiant further argues that because its well only drains 60 acres, its location 330 feet from the North line and 660 feet from the East line of Section 7 does not impair correlative rights.

10. Chevron/Conoco argued that the applications of Sapiant should be denied because the evidence presented during the hearing demonstrates that the Barber 12 well actually drains 165 acres, and its conclusion in this regard is supported by material balance calculations and production decline analysis.

11. Chevron/Conoco point out that evidence of drainage is seen in Chevron's G.C. Mathews Well No. 12 (hereinafter referred to as "the Mathews 12 well"), 736 feet north of the Barber 12 well. Chevron/Conoco argue that the Barber 12 well has already drained beyond the Mathews 12 well and the pressure found in the Mathews 12 well when it was re-completed in late 2001 verifies this drainage.

12. The Barber 12 well is within the West Monument-Tubb Gas Pool. The West Monument-Tubb Gas Pool was created on January 12, 2000 in Order No. R-11304 (Case No. 12321). The pool was created for production of natural gas from the Tubb formation and comprises the E/2 of Section 7, Township 20 South, Range 37 East, NMPM, Lea County, New Mexico.

13. The West Monument-Tubb Gas Pool is subject to 19.15.3.104(C)(3) NMAC, which establishes 160-acre gas spacing units comprising a single governmental quarter section, and 19.15.3.104(D)(3) NMAC, which restricts the number of producing wells within a single gas spacing unit within non-prorated pools.

14. Sapient owns 100% of the working interest in the E/2 E/2 of Section 7, Township 20 South, Range 37 East, NMPM, Lea County, New Mexico.

15. The working interest ownership of the W/2 E/2 of Section 7 is divided amongst the following working interest owners:

Conoco, Inc.	37.41862%
Phillips Petroleum Company	25.00000%
Atlantic Richfield Company	
(ARCO), now BP/Amoco	18.70931%
Chevron	18.70931%
James Burr	0.06511%
Larry Nermyr	0.06511%
Ruth Sutton	0.03255%

16. The Barber 12 well was drilled by Sinclair Oil & Gas Company in December 1953/January 1954 to a total depth of 5,250 feet and was subsequently completed in the Monument-Paddock Pool at a standard oil well location within a standard 40-acre oil spacing and proration unit comprising the NE/4 NE/4 of Section 7. In 1993 ARCO Oil & Gas Company, successor operator to Sinclair Oil & Gas Company, sold the Barber 12 well to Cross Timbers Operating Company (hereinafter referred to as "Cross Timbers"), which in December 1998 deepened the well to 7,530 feet. From January, 1999 to August, 1999 the well produced as an oil well from the Monument-Abo Pool (production interval 6,892 feet to 7,380 feet) at a standard location for a 40-acre oil spacing and proration unit also comprising the NE/4 NE/4 of Section 7.

17. Administrative notice is taken of a copy of the Division's well file pertaining to the Barber 12 well.

18. Cross Timbers filed its intent to re-complete the Barber 12 well on August 18, 1999 to the Tubb formation as an oil well. Cross Timbers also applied, on September 10, 1999, for approval to plug the Barber 12 well back and re-complete it in the Tubb interval as a gas well and dedicated the 160 acres comprising the E/2 E/2 of Section 7 to the well.

19. As a gas well, the Barber 12 well was located at an unorthodox location and the acreage purportedly dedicated to the well by Cross Timbers comprises a non-standard unit.

20. Falcon Creek Resources, Inc. (hereinafter referred to as "Falcon Creek") acquired the Barber 12 well from Cross Timbers on April 1, 2000 and Sapient acquired the well from Falcon Creek on July 14, 2000 through merger.

21. The Barber 12 well produced at a rate of about 500 mcf/day after completion in August of 1999 until January 2000, at which time the well was fractured. After fracturing, the well increased its production to over 1,400 mcf/day, but Cross Timbers kept the well choked. At the time it was shut-in by Order of the Division in October 2001, the well was producing approximately 840 mcf/day. At the time the well was shut-in it had produced 808 mmcf according to Sapient, 818 mmcf according to Chevron/Conoco and 935 mmcf according to Division records.

22. Chevron re-completed the Matthews 12 well, located 330 feet from the South line and 990 feet from the East line (Unit P) of Section 6, Township 20 South, Range 37 East, NMPM, Lea County, New Mexico, into the Tubb formation in late 2001. This well is also located in an unorthodox location, but the location was approved in Division Administrative Order NSL-3752-A, dated August 29, 2001.

23. Administrative notice is taken of a copy of the Division's well file pertaining to the Mathews 12 well.

24. The Mathews 12 well directly offsets the Barber 12 well and is approximately 736 feet north.

25. The key issue for the Commission to resolve in this matter is the drainage of the Barber 12 well. If the Barber 12 well drains less than 80 acres, Sapient's applications may be approved; if the well drains more than 80 acres, the applications should be denied. Resolving the question of the well's true drainage requires application of principles of petroleum engineering.

26. Both parties presented detailed engineering and geological testimony and exhibits in support of their respective positions. But the conclusions drawn by the parties are based on engineering interpretation and judgment, which must be exercised carefully. In general, each party exercised that interpretation and judgment in favor of its respective position. Thus, while Sapient claims the well drains between 53 and 60 acres and no more than 80 acres and Chevron/Conoco claim the well drains 165 acres, the truth is

probably somewhere in between. But, in order for Sapient to be successful in its application, it must convince this body that the well drains 80 acres or less.

27. The drainage of a well like the Barber 12 well is estimated by calculating the initial gas in place. Gas in place can be determined by plotting P/Z against Σq , where P is the downhole pressure, Z is a constant derived from the temperature and pressure of the formation of interest, and Σq is accumulated production. The parties refer to this methodology as a "material balance" calculation.

28. No initial pressure readings were made when the Barber 12 well was re-completed as a gas well, and therefore the initial pressure, P_i , is unknown and must be extrapolated from available data.

29. Sapient calculates P_i at 2597 psia (Sapient Exhibits 14, 18), and used an initial constant, Z_i , of 0.7837 to calculate a P_i/Z_i of 3314 psia. Sapient's initial pressure calculation was based on the average of six drill stem tests from wells producing from the Tubb formation that were within five miles of the Barber 12 well. The tests were performed early in the life of the reservoir, in the 1940s, 1950s and 1960s.

30. Chevron/Conoco calculated the well's initial pressure at 2462 psia (Chevron/Conoco Exhibit 8 revised, Exhibit 14) and used a Z_i of 0.7687 to calculate a P/Z of 3202.4 psia. Chevron/Conoco extrapolated an initial pressure from known readings in six nearby wells, excluded the two highest and lowest readings, and normalized the calculated pressure gradients to a common datum, resulting in a pressure gradient of 0.386 psi/ft and yielding an estimate of the initial pressure in the Barber 12 well of 2,468 psi at 6394 feet.

31. The parties differ on the cumulative production of the Barber 12 well. Sapient claims cumulative production is 808 mmcf (Sapient Exhibit 21) but also notes that its October figures were estimated. Chevron/Conoco claims cumulative production is 818 mmcf (Chevron/Conoco, Exhibit 15). Division records indicate that the various operators have reported total production from the Barber 12 well of 935 mmcf. It is thus apparent that total production is closer to 818 mmcf than 808 mmcf and probably in excess of the total production used by the parties during the hearing.

32. Both parties calculated P/Z of the Barber 12 well as of the date of its shut-in. Sapient calculated P/Z from an October, 2001 shut-in pressure test, which yielded a shut-in bottom hole pressure as of that date of 1231 or 1235 psia depending on the depth. Sapient calculated the Z factor of 0.8362, and derived a P/Z as of October 24, 2001 of 1477 psia. Chevron/Conoco calculated P/Z by an entirely different means. Chevron/Conoco rejected Sapient's shut-in pressure test as defective because the gauge was not run down to the midpoint perforations and no information was provided concerning liquids in the well, both of which could have resulted in higher pressure. From this analysis, Chevron/Conoco used a bottom hole pressure of 1446 psia as of September 6, 2001, and calculated a Z factor of 0.8026, from which it calculated P/Z to be 1801.6 psi.

33. Sapiient thus calculated gas in place at the Barber 12 well as 1.458 bcf. Chevron/Conoco calculated gas in place at the Barber 12 well as 1.828 bcf. Sapiient used an abandonment pressure of 300 psia to calculate an estimated ultimate recovery of 1.326 bcf, and Chevron/Conoco used an abandonment pressure of 250 psia to calculate an estimated ultimate recovery of 1.680 bcf.

34. Armed with its material balance calculations, Sapiient calculated the drainage area by dividing the estimated ultimate recovery by its estimate of the amount of pay (30 feet), divided by its calculation of the gas present per acre foot (0.815 mmcf/acre-foot), which Sapiient arrived at through standard volumetric calculations.¹ This calculation resulted in a drainage area of the Barber 12 well of 53 or 60 acres.

35. Chevron/Conoco calculated the drainage area by dividing the estimated ultimate recovery by the amount of pay (26.5 feet), divided by its calculation of the estimated ultimate recovery in terms of gas per acre foot (0.3813 mmcf/acre-foot). This calculation resulted in a total drainage radius of the Barber 12 well of 1513 feet. Chevron/Conoco also calculated the radius drained by the well to date, 1060 feet. Chevron/Conoco's calculations resulted in a total drainage area for the Barber 12 well of 165 acres.

36. Both parties used decline curve analysis to verify the results of the material balance calculations. Decline curve analysis uses the well's production patterns to assemble data; once production begins and the pressure in the well begins to drop, data points may be accumulated and these points plotted. Once enough data points are accumulated, a judgment concerning the resulting decline rate can be made. The intersection of the resulting line with the x-axis is the cessation of production and may help determine the amount of gas in place.

37. Applying decline curve analysis to the Barber 12 well is difficult because of the lack of consistent production over time and the production problems detailed by the parties. For example, the parties testified that the Barber 12 well experienced pipeline curtailment and damage. The well began production as a gas well in December of 1999 and produced for a period of time. The well was choked back during the months of June and July 2001 due to pipeline constraints and subsequently developed a scaling problem. The parties disagree whether the various production trends experienced by the well are significant.

38. However, as very small differences in calculation of the slope in a decline study result in large differences in the determination of the amount of gas in place, decline curve analysis is dependent on the exercise of judgment. A certain amount of subjectivity is also present in decline analysis because it relies on selecting or rejecting relevant data points and using engineering judgment concerning the most likely decline based on the circumstances. Each party has made an interpretation of the data that benefits that party.

¹ For example, see Katz & Lee, *Natural Gas Engineering: Production and Storage*, at 434-435 (1990).

39. Based on its decline curve analysis, Sapiant claims a rate of decline of 43% and Chevron/Conoco claims the rate of decline is actually 30%. The resulting calculations of gas in place are 1.759 bcf (Chevron/Conoco) and 1.3 bcf (Sapiant) respectively. Thus, Chevron/Conoco calculates that remaining reserves are in the neighborhood of 852 mmcf, and Sapiant calculates remaining reserves to be 507 mmcf.

40. It appears from the evidence presented that the Barber 12 well drains far in excess of 80 acres and the approach used by Sapiant to evaluate the drainage of the Barber 12 well is defective.

41. In its analysis, Sapiant used the most liberal assumptions possible in estimating the drainage area and arrived at the result that benefits its position. However, Sapiant's approach is not reasonable because it is inconsistent with the physical phenomena documented by the parties.

42. For example, the initial pressure found during re-completion of the Mathews 12 well was 1,440 psia. Since the initial reservoir pressure was in the neighborhood of 2,500 psia, it is obvious that the Mathews 12 well has suffered significant depletion before production even commenced from that well. The only reasonable source of that depletion is the Barber 12 well. If the Barber 12 well only drains 60 acres as alleged by Sapiant, the Mathews well, 736 feet away, should not be so depleted. Indeed, if the well drains only 60 acres, the drainage radius should only be around 670 feet at this time, and downhole pressure at the Mathews 12 well should be closer to 2,500 psia. The depletion of the Mathews 12 well demonstrates that the Barber 12 well will ultimately drain far more than 60 to 80 acres. Sapiant's conclusions to the contrary are defective since they fail to account for this observation.

43. Sapiant's porosity assumptions may be the single most significant factor reconciling the parties' differing calculations of the drainage area of the Barber 12 well; Sapiant's assumption of 12.2% porosity yields a calculation of recoverable gas in place of 741.3 mcf/acre-foot, whereas Chevron/Conoco's assumption of 6.6% yields recoverable gas in place of 381.5 mcf/acre-foot, almost half of Sapiant's calculated value. Sapiant's assumption has the same affect on the drainage calculations so that Sapiant's drainage area was calculated at 60 acres and Chevron/Conoco's calculation was 165 acres.

44. Sapiant's conclusion does not agree with the physical properties observed by Chevron in the Mathews 12 well when it re-completed that well. When that well was re-completed, it was logged and porosity logs were developed. Chevron obtained pressure data and sidewall cores. Examining the logs is important, but obtaining the actual reservoir rock provides an important confirmation of their accuracy, and the core data correlate very strongly with porosity values calculated from the neutron density cross plot.

45. The strong correlation between the plots based on the data from the sidewall cores and the neutron density cross plot seems to confirm the accuracy of the log results

and therefore seems to confirm Chevron/Conoco's calculation of many reservoir properties, including its porosity: 6.6%.

46. Sapien's technique of calculating porosity from PE bulk density is not the best method of determining these values, particularly when the actual rock is available to test. Moreover, Chevron/Conoco's core data confirmed the presence of anchorite, dolomite, limestone and pyrite in the formation that most likely would have skewed PE results.

47. While the cores were taken from the Mathews 12 well, not the Barber 12 well, the correlation of the logs from the two wells seems to confirm the similarity of the rocks in the two wells, and helps to establish the validity of data obtained from the Mathews 12 well for analyzing characteristics of the reservoir at the Barber 12 well. Thus Chevron/Conoco's calculation of the net feet of pay for the Barber 12 well of 26.5 feet with an average porosity of 6.6 seems more reasonable than Sapien's calculations in this regard.

48. Sapien's failure to correlate its engineering judgments with observed phenomena apparently affected its engineering conclusions. Sapien's calculation of P_i is an example. As noted, the initial pressure was not available in the Barber 12 well. Sapien used pressures from completions deeper in the Tubb formation as a basis like Chevron, but made no attempt to normalize those pressures to a common datum and instead used simple averaging. This approach supported Sapien's own analysis, but does not appear to reflect a realistic view of the reservoir. Chevron/Conoco, by contrast, used conservative assumptions whenever possible and calculated the pressure gradient to a common datum, established the pressure gradient expected in the Barber 12 well, and applied the pressure gradient to arrive at P_i .

49. Another example is Sapien's decline curve analysis. Sapien's analysis verifies its other conclusions but doesn't account for the depletion seen at the Mathews 12 well. Sapien disregarded key facts such as the restriction of the well, the pipeline constraints, and the scaling problem which affected production. Selection and rejection of points during decline analysis introduces an element of subjectivity unless correlated with objective facts, and the physical data, such as the bottomhole pressures, the significant depletion at the Mathews 12 well, and the core samples, do not support Sapien's analysis.

50. All these facts, taken collectively, establish that Sapien's analysis is strained to achieve the result it desires. Chevron/Conoco has also strained its data to some degree to reach a desired (and opposite) result, but its approach is not only more principled and scientific but also correlates with the observed conditions.

51. Thus, the engineering and geological evidence, taken as a whole, establishes that the Barber 12 well drains considerably more than 60-80 acres. The evidence supports a conclusion that the standard 160-acre spacing unit consisting of a governmental quarter section is the appropriate unit for the well.

52. The engineering and geological evidence supports a conclusion that the Barber 12 well is capable of draining in excess of 80 acres and Sapient's proposed special rules adopting 80-acre spacing will result in the drilling of unnecessary wells thereby causing waste.

53. The engineering and geological evidence supports a conclusion that establishing 80-acre spacing in the West Monument-Tubb Gas Pool would violate correlative rights of other interest owners in Section 7, as evidence indicates that wells in Section 7 will drain in excess of 80 acres.

54. Adoption of special pool rules for the West Monument-Tubb Gas Pool providing for 80-acre spacing, or creation of a non-standard spacing unit for the Bertha J. Barber Well No. 12 comprising the E/2 E/2 of Section 7, will result in reserves being drained from offsetting tracts which could only be recovered by the owners of those reserves by the drilling of unnecessary wells.

55. To the extent that Sapient still claims that it relied upon Division approval of certain forms in connection with the re-completion of the Barber 12 well, any such reliance was misplaced. Division rules 19.15.3.104(B)(2) NMAC, and 19.15.3.104(D)(2) NMAC, require an operator to file an application for administrative approval of a non-standard well location and receive approval of that location before production from the well begins, and apply for and receive administrative approval of a non-standard unit before production begins. In the absence of such approval, a 160-acre unit should have been dedicated to the Barber 12 well. 19.15.3.104(C)(3) NMAC. The purported dedication of a 160-acre unit to the Barber 12 well on an application for a permit to drill is thus ineffective. Division approval of the forms submitted by Cross Timbers cannot substitute for the administrative approval process, particularly since that process involves notice to affected parties.

56. The 160-acre standard unit comprising the NE/4 of Section 7 in the West Monument-Tubb Gas Pool in place by operation of 19.5.3.104(C)(3) should remain unchanged.

57. The requested unorthodox location of the Bertha J. Barber Well No. 12 was not an issue in this matter. The unorthodox location of the Barber 12 well should therefore be approved.

58. The application of Sapient in Case No. 12587 for approval of two non-standard 160-acre gas spacing units in the E/2 of Section 7 should be denied. Further, the application of Sapient in Case No. 12605 for the adoption of special pool rules for the West Monument-Tubb Gas Pool should also be denied.

59. Should voluntary agreement not be reached with parties in the standard 160-acre unit with respect to pooling of the various interests pursuant to NMSA 1978, § 70-2-17(A) and concerning allocation or reallocation of production since September 9, 1999,

the date of first production, the parties should seek compulsory pooling from the Division pursuant to NMSA 1978, § 70-2-16(C).

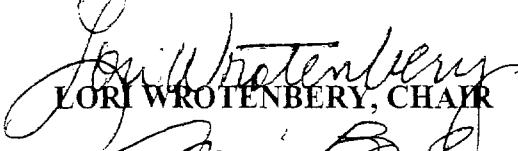
60. With entry of this order, the Division's order requiring shut-in of the Barber 12 well should be rescinded and production permitted to resume.

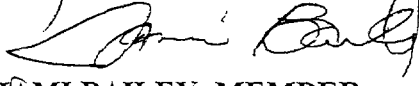
IT IS THEREFORE ORDERED THAT:

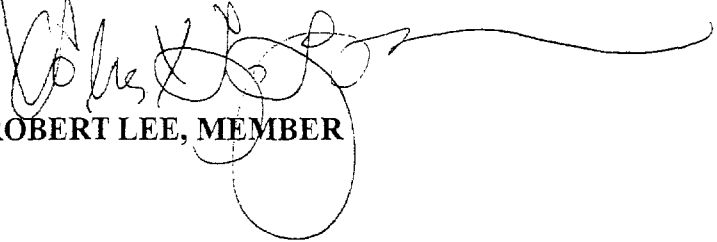
1. The application of Sapient Energy Corporation in Case No. 12587 for an unorthodox well location for its Bertha J. Barber Well No. 12 is granted.
2. The application of Sapient Energy Corporation in Case No. 12587 for a non-standard 80-acre gas spacing unit consisting solely of its acreage in the E/2 of the NE/4 of Section 7 is denied.
3. The application of Sapient Energy Corporation in Case No. 12587 for a non-standard 80-acre gas spacing unit consisting of the W/2 of the N/E/4 of Section 7 is denied.
4. The application of Sapient Energy Corporation in Case No. 12587 for retroactive approval is denied as moot given the above orders.
5. The application of Sapient Energy Corporation in Case No. 12605 for special pool rules for the West Monument-Tubb Gas Pool identical to existing rules in the Monument Tubb Oil Pool, including standard 80-acre spacing units and a 330-foot set back requirement for both oil and gas wells is denied.
6. The order of the Division shutting-in the Bertha J. Barber Well No. 12 is hereby rescinded.
7. Jurisdiction of this case is retained for the entry of such further orders as the Commission may deem necessary.

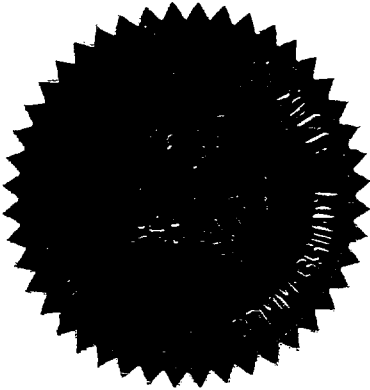
DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

**STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION**


LORI WROTENBERY, CHAIR


JAMI BAILEY, MEMBER


ROBERT LEE, MEMBER



SEAL