Case No.

6558

Application

Transcripts

Small Exhibits

ETC.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

LARRY KEHOE
SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

July 18, 1979

Mr. Thomas Kellahin
Kellahin & Kellahin
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Re: CASE NO. 6558
ORDER NO. R-6051

Applicant:

Llano, Inc.

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

Other William F. Carr

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

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

CASE NO. 6558
Order No. R-6051

APPLICATION OF LLANO, INC. FOR
A NON-STANDARD GAS PRORATION UNIT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on May 29, 1979, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 17th day of July, 1979, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the application of Llano, Inc., for a 320-acre non-standard gas proration unit comprising the E/2 of Section 34, Township 21 South, Range 34 East, NMPM, Lea County, New Mexico, was predicated on the temporary 640-acre spacing and proration units and well location requirements promulgated by Order No. (3) on Pages 4 and 5 of Division Order No. R-5995.

(3) That the Division, by its Order No. R-6050 rescinded said Order No. (3) of Division Order No. R-5995, and the Morrow formation underlying the aforesaid E/2 of Section 34 is now subject to 320-acre well spacing and location requirements, thereby rendering this case moot.

(4) That Case No. 6558 should be dismissed.

IT IS THEREFORE ORDERED:

(1) That Case No. 6558 is hereby dismissed.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

ALEX J. ARMIJO, Member

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

fd/

SABINE PRODUCTION COMPANY
901 Wall Towers East 201 Wall Street Midland, Texas 79701 (915) 683-5607

C. H. Madsen
District Geologist

May 24, 1979

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Mr. Joe Ramey

Re: Cases 6557, 6497 and 6558
Dated May 29, 1979

Gentlemen:

Sabine Production Company, as a 25% Working Interest Participant in Getty "36" State Com. #1 Well and owner of other leases in the Gramma Ridge Area, expresses the following feelings in the subject cases:

1. Case 6557 - Concur with 640 acre spacing and 1650' measurement from outer lease lines.

2. Case 6497 - Object to the application of Llano to drill an unorthodox gas well with respect to location and recommend that a well be penalized for any variance from field rules.

3. Case 6558 - Object to the application of Llano for a non-standard spaced unit and recommend that a well be penalized for any variance from field rules.

Very truly yours,

SABINE PRODUCTION COMPANY

C. H. Madsen
District Geologist

/wb

DOCKET: COMMISSION HEARING - TUESDAY - MAY 29, 1979

OIL CONSERVATION COMMISSION - 9 A.M. - ROOM 205
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 6557: Application of Getty Oil Company for pool creation and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order creating a new Morrow gas pool for its State 35 Well No. 1 located in Unit K of Section 35, Township 21 South, Range 34 East, and its Getty Two State Well No. 1 located in Unit F of Section 2, Township 22 South, Range 34 East, and for promulgation of special pool rules, including provision for 640-acre gas well spacing.

CASE 6497: (DE NOVO)

Application of Llano, Inc. for an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of a well to be located 1650 feet from the South line and 660 feet from the East line of Section 34, Township 21 South, Range 34 East, Grama Ridge-Morrow Gas Pool, the E/2 of said Section 34 to be dedicated to the well.

Upon application of Getty Oil Company this case will be heard De Novo pursuant to the provisions of Rule 1220.

CASE 6558: Application of Llano, Inc. for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for a 320-acre non-standard gas proration unit comprising the E/2 of Section 34, Township 21 South, Range 34 East, to be dedicated to its Llano 34 State Com Well No. 1 located in Unit I of said Section 34.

CASE 6559: Application of Roy L. McKay for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for his Morton Solid State Unit Area, comprising 1,480 acres, more or less, of State lands in Township 15 South, Range 34 East.

CASE 6487: (Continued from February 28, 1979, Examiner Hearing)

Application of El Paso Natural Gas Company for approval of infill drilling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks a waiver of existing well-spacing requirements and a finding that the drilling of its Shell E State Com Well No. 2 located in Unit N of Section 6, Township 21 South, Range 36 East, Fumont Gas Pool, Lea County, New Mexico, is necessary to effectively and efficiently drain that portion of the proration unit which cannot be so drained by the existing well.

CASE 6471: (Continued from February 28, 1979, Examiner Hearing)

Application of Consolidated Oil & Gas, Inc. for approval of infill drilling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks a waiver of existing well-spacing requirements and a finding that the drilling of its Freeman Well No. 1-A to be located in Unit C of Section 11, Township 31 North, Range 13 West, Basin-Dakota Pool, San Juan County, New Mexico, is necessary to effectively and efficiently drain that portion of the proration unit which cannot be so drained by the existing well.

CASE 6472: (Continued from February 28, 1979, Examiner Hearing)

Application of Consolidated Oil & Gas, Inc. for approval of infill drilling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks a waiver of existing well-spacing requirements and a finding that the drilling of its Jenny Well No. 1-A to be located in Unit P of Section 13, Township 26 North, Range 4 West, Basin-Dakota Pool, Rio Arriba County, New Mexico, is necessary to effectively and efficiently drain that portion of the proration unit which cannot be so drained by the existing well.

CASE 6473: (Continued from February 28, 1979, Examiner Hearing)

Application of Consolidated Oil & Gas, Inc. for approval of infill drilling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks a waiver of existing well-spacing requirements and a finding that the drilling of its McIntyre Well No. 1-A to be located in Unit K of Section 11, Township 26 North, Range 4 West, Basin-Dakota Pool, Rio Arriba County, New Mexico, is necessary to effectively and efficiently drain that portion of the proration unit which cannot be so drained by the existing well.

CASE 6474: (Continued from February 28, 1979, Examiner Hearing)

Application of Consolidated Oil & Gas, Inc. for approval of infill drilling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks a waiver of existing well-spacing requirements and a finding that the drilling of its Williams Well No. 1-A to be located in Unit C of Section 24, Township 31 North, Range 13 West, Basin-Dakota Pool, San Juan County, New Mexico, is necessary to effectively and efficiently drain that portion of the proration unit which cannot be so drained by the existing well.

CASE 6475: (Continued from February 28, 1979, Examiner Hearing)

Application of Consolidated Oil & Gas, Inc. for approval of infill drilling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks a waiver of existing well-spacing requirements and a finding that the drilling of its Montoya Well No. 1-A to be located in Unit I of Section 35, Township 32 North, Range 13 West, Basin-Dakota Pool, San Juan County, New Mexico, is necessary to effectively and efficiently drain that portion of the proration unit which cannot be so drained by the existing well.

Dockets Nos. 23-79 and 24-79 are tentatively set for hearing on June 13 and 27, 1979. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - MAY 23, 1979

9 A.M. - OIL CONSERVATION DIVISION CONFERENCE ROOM, STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner:

CASE 6545: In the matter of the hearing called by the Oil Conservation Division on its own motion to permit Corinne Grace, Travelers Indemnity Company, and all other interested parties to appear and show cause why the Kuklah Baby Well No. 1 located in Unit G of Section 24, Township 22 South, Range 26 East, Eddy County, New Mexico, should not be plugged and abandoned in accordance with a Division-approved plugging program.

CASE 6422: (Continued from February 28, 1979, Examiner Hearing)

In the matter of the hearing called by the Oil Conservation Division on its own motion to permit Helton Engineering & Geological Services, Inc., Travelers Indemnity Company, and all other interested parties to appear and show cause why the Brent Well No. 1 located in Unit M of Section 29 and the Brent Well No. 3 located in Unit G of Section 19, both in Township 13 North, Range 6 East, Sandoval County, New Mexico, should not be plugged and abandoned in accordance with a Division-approved plugging program.

CASE 6546: Application of Black River Corporation for compulsory pooling and non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Jalmat Gas Pool underlying the SW/4 of Section 32, Township 23 South, Range 37 East, to form a 160-acre non-standard gas proration unit to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6536: (Continued from May 9, 1979, Examiner Hearing)

Application of Black River Corporation for two non-standard gas proration units, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for two 80-acre non-standard gas proration units in the Jalmat Gas Pool as follows: the N/2 SE/4 of Section 22, Township 23 South, Range 36 East, to be dedicated to applicant's well to be drilled in Unit J of said Section 22; and the S/2 SE/4 of said Section 22 to be dedicated to El Paso Natural Gas Company's Shell State Well No. 3 located in Unit P.

CASE 6535: (Continued from May 9, 1979, Examiner Hearing)

Application of Torreon Oil Company for a waterflood project, Sandoval County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the San Luis-Mesaverde Pool by the injection of water into the Menefee formation through two wells located in Section 21, Township 18 North, Range 3 West, Sandoval County, New Mexico.

CASE 6547: Application of American Petrofina Company of Texas for the creation of a waterflood buffer zone, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a waterflood buffer zone comprising the NE/4 SE/4 of Section 26, Township 17 South, Range 32 East, Maljamar Grayburg-San Andres Pool, to enable applicant to produce its Johns B Well No. 4 located thereon at an unrestricted rate.

CASE 6548: Application of John F. Staver for salt water disposal, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Dakota formation through the open hole interval from 1408 feet to 1412 feet in his Table Mesa Well No. 22 located in Unit N and from 1394 feet to 1400 feet in his Table Mesa Well No. 23 located in Unit O, both in Section 34, Township 28 North, Range 17 West, Table Mesa-Dakota Oil Pool.

CASE 6549: Application of Gulf Oil Corporation for pool creation, discovery allowable, and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order creating a new Bone Springs oil pool for its Lea "YH" State Well No. 1 located in Unit O of Section 25, Township 18 South, Range 34 East. Applicant also seeks a discovery allowable and promulgation of special pool rules, including a provision for 80-acre spacing.

CASE 6550: Application of Yates Petroleum Corporation for an unorthodox gas well location and compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp through Mississippian formations underlying the S/2 of Section 12, Township 19 South, Range 24 East, to be dedicated to its Allison Federal "CQ" Well No. 2 to be drilled at an unorthodox location 1980 feet from the South line and 660 feet from the West line of said Section 12. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6492: (Continued from May 9, 1979, Examiner Hearing)

Application of Yates Petroleum Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the San Andres formation underlying the NE/4 NW/4 of Section 13, Township 17 South, Range 25 East, Eddy County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6551: Application of Bass Enterprises Production Company for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for an unorthodox Lower Morrow gas well location 1980 feet from the North line and 660 feet from the East line of Section 1, Township 19 South, Range 28 East, the N/2 of said Section 1 to be dedicated to the well.

CASE 6528: (Continued from April 25, 1979, Examiner Hearing)

Application of Bass Enterprises Production Co. for an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for an unorthodox Morrow test well location to be drilled 660 feet from the North and West lines of Section 10, Township 21 South, Range 32 East, Lea County, New Mexico, the W/2 of said Section 10 to be dedicated to the well.

CASE 6552: Application of Maddox Energy Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the E/2 of Section 3, Township 24 South, Range 28 East, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6553: Application of The Atlantic Richfield Company for approval of infill drilling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks a finding that the Division waived existing well-spacing requirements and found that the drilling of additional wells was necessary to effectively and efficiently drain those portions of the proration units in the Empire Abo Unit located in Townships 17 and 18 South, Ranges 27, 28 and 29 East, which could not be so drained by the existing wells.

CASE 6554: Application of The Atlantic Richfield Company for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all royalty interests in the Devonian, McKee, and Ellenburger formations underlying the E/2 of Section 20, Township 22 South, Range 36 East, Langlie Field, to be dedicated to a well to be drilled at a standard location thereon.

CASE 6555: Application of Jake L. Hamon for an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for an unorthodox location 660 feet from the North line and 560 feet from the East line of Section 30, Township 20 South, Range 36 East, North Osudo-Morrow Gas Pool, all of said Section 30 to be dedicated to the well.

CASE 6556: Application of Curtis Little for the amendment of Order No. R-5962, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-5962 to provide for the unorthodox location of a well to be drilled 1000 feet from the South line and 50 feet from the East line of Section 11, Township 28 North, Range 12 West, Basin-Dakota Pool, and for the extension of the date to commence drilling.

CASE 6435: (Continued from February 28, 1979, Examiner Hearing)

Application of Amerada Hess Corporation for approval of infill drilling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks a finding that the drilling of its W. A. Weir "B" Well No. 3 located in Unit B of Section 26, Township 19 South, Range 36 East, Eumont Gas Pool, Lea County, New Mexico, is necessary to effectively and efficiently drain that portion of the proration unit which cannot be so drained by the existing well, and further seeks approval of a waiver of existing well-spacing requirements.

LLANO, INC.
PHONE 393-2153 P. O. DRAWER 1320
HOBBS, NEW MEXICO 88240

G. W. EDWARDS
EXECUTIVE VICE PRESIDENT

May 4, 1979

Case 6558

New Mexico Oil Conservation Division
Post Office Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. J. D. Ramey

Re: Application for a Non-Standard
Gas Proration Unit
Llano "34" State Com. No. 1
Undesignated Morrow Field
Lea County, New Mexico

Gentlemen:

Llano, Inc. respectfully requests a hearing to be docketed for May 29, 1979, to consider a 320-acre non-standard gas proration unit dedication application for the Llano "34" State Com. No. 1, located 1650' FSL and 660' FEL of Section 34, T21S, R34E, Lea County, New Mexico, as ordered under (2) of Case No. 6497, Order No. R-5996 of the New Mexico Oil Conservation Division dated May 2, 1979.

Very truly yours,

LLANO, INC.

G. W. Edwards

AK:lg

xc: Donald L. Garey
W. L. Smith
Managers
D. M. File

Llano File No. E5.20.79

29th

Application of Llano Inc
for a non-standard gas
proration unit, Lea County,
New Mexico

Applicant, in the above-styled cause, seeks
approval for a 320-acre non-standard
gas proration unit comprising the E/2 of
Section 34, Township 21 South, Range 34
East, to be dedicated to its Llano 34 State
Com Well No. 1 located ~~in Unit~~ in Unit I
of said Section 34.

called in by Al Klaer 11:20 am 5/4/79

Written application to follow

ROUGH

dr/

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

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

CASE NO. 6558

Order No. R-6051

APPLICATION OF LLANO, INC. FOR
A NON-STANDARD GAS PRORATION UNIT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 am on May 29, 1979, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this _____ day of July, 1979, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the application of Llano, Inc., for a 320-acre non-standard gas proration unit comprising the E/2 of Section 34, Township 21 South, Range 34 East, NMPM, Lea County, New Mexico, was predicated on the temporary 640-acre spacing and proration units and well location requirements promulgated by Order No. (3) on Pages 4 and 5 of Division Order No. R-5995.

(3) That the Division, by its Order No. R-6050 rescinded said Order No. (3) of Division Order No. R-5995, and the Morrow formation underlying the aforesaid E/2 of Section 34 is now subject to 320-acre well spacing and location requirements, thereby rendering this case moot.

(4) That Case No. 6558 should be dismissed.

IT IS THEREFORE ORDERED:

(1) That Case No. 6558 is hereby dismissed.

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

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
Oil Conservation Division
State Land Office Building
Santa Fe, New Mexico
29 May 1979

COMMISSION HEARING

IN THE MATTER OF:

Application of Getty Oil Company for pool creation and special pool rules, Lea County, New Mexico. CASE 6557

and

Application of Llano, Inc. for an unorthodox gas well location, Lea County, New Mexico. CASE 6497

and

Application of Llano, Inc. for a non-standard gas proration unit, Lea County, New Mexico. CASE 6558

BEFORE: Commissioner Joe Ramey
Commissioner Emery Arnold

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division: Ernest L. Padilla, Esq.
Legal Counsel for the Division
State Land Office Bldg.
Santa Fe, New Mexico 87503

NEW MEXICO OIL CONSERVATION COMMISSION

COMMISSION HEARING

SANTA FE, NEW MEXICO

Hearing Date MAY 29, 1979 Time: 9:00 A.M.

NAME	REPRESENTING	LOCATION
C.F. BOSECKER	GETTY OIL	MIDLAND, TX.
J.E. King	Getty Oil Co.	" "
R.A WIBF	GETTY OIL CO	MIDLAND, TEXAS
William F Carr	Campbell + Black, P.A.	Santa Fe, N.M.
GARY J HOOSE	TEXACO INC	MIDLAND TEXAS
Tom Kellahin	Kellahin + Kellahin	Santa Fe
STEVE COLLINS	LLANO, INC.	Hobbs
AL KLAAR	LLANO, INC.	HOBBS, N.M.
G.W. Edwards	" "	Santa Fe
R Hahn	Capitol Aberdeen	Hobbs
Don Carey	Llano, Inc	"
James Murray	" "	Hobbs NM
Don Maddox	Maddox & Maddox	

A P P E A R A N C E S

For Getty Oil Co.: William F. Carr, Esq.
CAMPBELL & BLACK
Jefferson Place
Santa Fe, New Mexico 87501

For Llano, Inc.: W. Thomas Kellahin, Esq.
KELLAHIN & KELLAHIN
500 Don Gaspar
Santa Fe, New Mexico 87501

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
8020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

I N D E X

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3030 Plaza Blanca (505) 471-8462
Santa Fe, New Mexico 87501

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E X H I B I T S

E X H I B I T S

SALLY WALTON BOYD
CERTIFIED SHORTHAND REPORTER
3020 Plaza Blanca (505) 471-2462
Santa Fe, New Mexico 87501

MR. RAMEY: The hearing will come to order.

We have three cases on the docket this morning, which we will consolidate for the purpose of testimony.

The first case is Case 6557, application of Getty Oil Company for pool creation and special rules, Lea County, New Mexico.

Case 6497, application of Llano, Inc. for an unorthodox well location -- gas well location, Lea County, New Mexico. This is a hearing de novo.

Case 6558, application of Llano, Inc. for a non-standard gas proration unit, Lea County, New Mexico.

I'll ask for appearances at this time.

MR. CARR: May it please the Commission, I'm William F. Carr, Campbell and Black, P. A., Santa Fe, appearing on behalf of Getty, and I have two witnesses to be sworn.

MR. KELLAHIN: I'm Tom Kellahin of Kellahin and Kellahin, Santa Fe, New Mexico. I'm appearing on behalf of Llano, Inc., and I have one witness to be sworn.

MR. RAMEY: I'll ask that the witnesses stand at this time and be sworn.

(Witnesses sworn.)

MR. RAMEY: Do you want to proceed, Mr. Carr?

MR. CARR: At this time I would call Chris Bosecker.

CHRIS BOSECKER

being called as a witness and having been duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CARR:

Q. Will you state your full name and place of residence?

A. Chris Bosecker, Midland, Texas.

Q. Mr. Bosecker, by whom are you employed and in what capacity?

A. Getty Oil Company, as the Lead Reservoir Engineer for the Midland E&P District.

Q. Mr. Bosecker, have you previously testified before this Commission, had your credentials accepted and made a matter of record?

A. Yes, I have and yes, they have.

Q. Are you familiar with the subject matter of each of the three cases that are being consolidated in this hearing?

A. I am.

MR. CARR: Are the witness' qualifications acceptable?

MR. RAMEY: I'll qualify him if he'll spell his last name.

MR. CARR: Can you do that, Mr. Bosecker?

A. B-O-S-E-C-K-E-R.

MR. RAMEY: Thank you.

Q. (Mr. Carr continuing.) Mr. Bosecker, will you please state what Getty is seeking in this hearing today?

A. In the first case Getty is seeking 640-acre spacing for the area in which Getty has drilled the wells, namely, Section 2 and Section 35 in Lea County, New Mexico, which we'll describe in more detail later.

Also 1650 feet from outer boundary of a well location.

Q. Mr. Bosecker, have you prepared certain exhibits for introduction in this hearing today?

A. Yes, I have.

Q. Will you please refer to what has been marked for identification as Exhibit Number One and explain to the Commission what it is and what it shows, and I will need additional copies of this exhibit.

A. How many do you want?

Q. Four or five.

A. Exhibit Number One is an area map showing the well locations in question. It is a general map showing the Grama Ridge Morrow area.

To give you a little more detail, you can see the Getty location in Section 2. This was a well that Getty drilled in 1977, completed in '78; potentialed for 1.9-million; drilled 1980 feet from a lease line.

A well that Getty drilled and completed in '79 in Section 35, for 11.1-million from the Morrow; 1650 feet from our lease line.

We are also drilling a well in Section 36 to the east, 1650 feet from our lease line.

Further to the west is an area which now is the Grama Ridge Morrow Pool as a result of the recent Order Number 5995.

Q. That is indicated by an orange line.

A. That is correct.

Q. And what does the blue line indicate?

A. The blue line indicates an area in which the Commission set aside 640-acre spacing, 1650 feet well locations from the outer boundary on a temporary basis.

Q. Mr. Bosecker, the three wells that Getty has drilled in the area to the east of the Grama Ridge Morrow Pool, are all of those wells drilled at standard

locations?

A. Yes. They were all drilled at standard locations at the time, and still.

To give you a little history of the area, the Grama Ridge Morrow Pool in the orange area was discovered by Shell in the early 1960's, and it was placed by the Commission on 640-acre spacing with 1650 feet from the outer boundary for locations.

In 1973, or in 1972 wells were purchased by Llano and in '73 they were -- a gas storage project was initiated in two of the wells.

After Getty drilled the two wells in Section 2 and 35, Llano, Incorporated, asked that the field be changed from 640 acres down to 320 acres, with a standard location being 660 feet from the lease line.

Q. Mr. Bosecker, will you now refer to what has been marked for identification as Getty's Exhibit Number Two and explain what it is and what it shows?

A. This is a Form C-105 for Getty's first completion in the subject area. The well was drilled 1980 from the north and the west line and potentialed, I believe the potential is on there, potentialed for 1.9-million from the Morrow formation.

Q. Will you now refer to what has been marked as EXhibit Number Three and explain this to the Commission?

A. Exhibit Number Three is a Form C-122, which is normally known as a Multi-point Back Pressure Test, submitted for the Getty Two State, showing 1.965 Mcf per day AOF.

Q. Will you now refer to Exhibit Number Four?

A. This is a Form C-105 on Getty 35 State Well No. 1, showing the well location 2310 feet from the south and 1650 feet from the west of the section line.

Q. Okay. Now I direct your attention to Exhibit Five and ask you to explain this exhibit to the Commission.

A. I would like to point out that this well also was completed in the Morrow.

Q. And you're talking about the Getty 35 State No. 1?

A. Yes. In fact, it was a dual completion but the Morrow is the zone that this hearing is about.

Exhibit Number Five is a Form C-122, 122 for Getty's 35 State Well No. 1, again a Multi-point Back Pressure Test showing the well potentialed for 11.107-million per day.

Q. Would you now refer to Exhibit Number Six?

A. Exhibit Number Six is for Getty 36 State Com No. 1. It is a Form 101 and Form 102, showing that this

well also was a standard spaced well, no closer than 1650 feet from the lease line.

Q Now, Mr. Bosecker, I direct your attention to Exhibit Number Seven and ask you to explain to the Commission what this exhibit shows.

A Exhibit Number Seven is a structural cross section map of the general area of the Grama Ridge Pool, Lea County, New Mexico.

The vertical scale is 1 inch equal 100 feet. The horizontal scale is 1 inch equal 500 feet.

The cross section is made by using porosity logs and the datum that these logs are hung on was a -9000 feet.

This exhibit shows the general structure across the field from the Pogo Well in Section 28 through the Llano Well No. 3, the Llano No. 2, and then the Getty 35 State No. 1. As you can see from going from the left to the right, you cross a major fault with substantial amount of throw with the downthrown side to the north. Then the two Llano wells are on the upthrown side and you cross another fault on the east with the downthrown side to the east, and going further is the Getty 35 State No. 1, which is potentialed in the Morrow zone.

Also I would like to point out a few other things about this besides the faults.

Number one, the top of the Morrow is depicted on this map; also the top of the Morrow Clastics marker. This Morrow Clastics marker is very easily identifiable, and also identifiable are various producing horizons in the Morrow section, and that there is continuity across the structure as far as we know.

Q. All right, Mr. Bosecker, will you now refer to what has been marked for identification as Getty Oil Company Exhibit Number Seven and explain this exhibit to the Commission?

Okay, I'm sorry, would you now refer to Exhibit Number Eight?

A. Exhibit Number Eight is also a structural cross section of the Grama Ridge area, Lea County, New Mexico, with the same scale, built the same way, hung on the same datum, and shows basically the same thing. It just cuts the field in a different location, from Llano Well No. 4 to Llano No. 1 to the Getty Two State.

Again you can see the top of the Morrow, the Morrow Clastics marker, and the Morrow horizon.

Q. Will you now refer to what has been marked for identification as Exhibit Number Nine and explain to the Commission what it is and what it shows?

A. Exhibit Number Nine is a structural cross section of the Grama Ridge area, also, but this is just a

two-well cross section. The scale has been changed to show in detail the Getty 35 State No. 1, and the Getty Two State No. 1, both located on the east side of the east fault in this field.

Depicted here is the top of the Morrow limestone, the top of the Morrow Clastic marker, various horizons that can be traced and correlated from the one well to the other.

I would like to point out that in the Getty Two State on the left of the center column you can see the perforations that are included in that well.

You can see perforations below the Morrow Clastic marker is at, say, 12,050 feet, which correlates over to the other well, the Getty 35, at approximately 12,900 feet, the same horizon, which we -- we feel is productive.

Also above the Morrow Clastic marker is an interval at 12,762 feet, approximately. This zone is also perforated in the Getty Two State and is considered to be productive in the Getty Two State. This zone is also present in the Getty 35 State No. 1, and is considered to be productive but is yet to be perforated, there in the 35 No. 1.

This is a sandstone that has been found to be productive of gas and Getty feels that it is a part

of the Morrow.

Also, I'd like to point out that there has been some controversy as to whether it is Morrow or Atoka. The Getty Two State was the discovery well and we perforated above the Morrow Clastic and below the Morrow Clastic, and this section in this interval we construe to be productive, and this is the horizon that we want the field rules for, which we feel is Morrow.

Q. Now, Mr. Bosecker, I direct your attention to what has been marked as Exhibit Number Ten and ask you to explain that to the Commission.

A. Exhibit Number Ten is a structure contour map of the Grama Ridge area. This map shows several things about the geology of the area, mainly the fault to the west, is one of the main structural features, as you can see. This fault is well defined. It's down to the Basin, in other words, to the west; has a substantial amount of throw.

Also notice the area of the storage wells which Llano operates are on the upthrown side, as was depicted by the structure map. There is a fault to the east of these wells separating these wells from the two Getty wells that are in the Morrow. The location of this fault is -- is not as certain as the location of the other fault, and --

Q. Now, Mr. Bosecker, this was offered in

a previous case as Llano's Exhibit B, is that correct?

A. That is correct. The fault to the east is definitely a sealing fault, which testimony will show, and I think the Commission possibly has recognized already.

MR. KELLAHIN: I'm sorry, which fault?

A. The east.

It is a sealing fault. Its location has not been defined precisely but on this map you can see it starting in Section 15, paralleling the major regional fault, and then as it crosses on the Llano acreage in Section 10, it straightens up and goes due north and then turns to the east in Section 27.

Q. All right, Mr. Bosecker, will you now refer to what has been marked for identification as Exhibit Number Eleven?

Now, Exhibit Number Eleven was also offered in the previous case by Llano, is that correct, Mr. Bosecker?

A. That is correct.

Q. All right. Will you please refer to it and explain to the Commission what it shows?

A. Exhibit Number Eleven primarily is the pressure history of the center portion of the -- of the Grama Ridge Morrow Field, namely two wells in the storage project, LLano GRN Unit No. 1, Llano GRN Unit No. 2.

As you can see, pressure initially was

in the neighborhood of -- well, 8616 to 8682 in these two wells. This is the bottom hole pressure. It declined to where it was stated that the field was depleted and one of the wells, the Llano GRN Unit No. 2, had a minimum bottom hole pressure of 378.

Then the field was converted to storage, gas storage, and built back up.

Getty's wells on the other side of the fault are depicted in the -- a portion in 1978 and '79. The initial bottom hole pressure being 8224 psi in the Getty Two State No. 1 and 7455 in the 35 State No. 1.

This, to us, shows that there is definitely a sealing fault, separating the storage project and the Getty wells.

Q Mr. Bosecker, will you now refer to what has been marked for identification as Getty's Exhibit Number Twelve and explain what this is and what it shows?

And again I think we should point out this was offered in the previous hearing as Llano's exhibit, E.

Will you now summarize this exhibit for the Examiner, or for the Commission?

A. Okay. This is a -- this Exhibit Number Twelve is -- shows that it's a drainage area calculation. It shows the four Llano wells that are located on the east

side of the fault, the fault being a sealing fault. Shows the primary gas production of these four wells. It also shows a Llano Government A Well with 1.5-billion cubic feet and the Getty 35 State with 5-billion cubic feet.

Working down through this, the original gas in place has been calculated. The thickness of the net productive sands are shown. Note the No. 1 Well is 24 feet; the No. 2 Well is 20 feet; the No. 3 Well is 15; and the No. 4 is 15; the No. 6 is 6, and so on, and the calculated drainage area for each of these wells has been calculated.

The faults are depcited on the structure map are sealing faults. It is our contention that since they're sealing faults, that these drainage radius calculations show the restriction of production because the wells could not drain in a radial manner.

Q. Now, Mr. Bosecker, you're talking in this instance about the Llano Wells 1 through 4, is that correct?

A. That is correct. The Llano Government No. 4 is close to a fault but it doesn't have a well opposite it, so it -- it obviously can drain more acreage.

Also, I'd like to point out that this exhibit was to -- was utilized to show that 327-acre drainage was the most that you could expect even on the east side as a result of what's on the west side of the

fault, but that the Getty 35 State No. 1 was included in the calculation to show that the Getty 35 State No. 1 couldn't get more than 320 acres.

Q. Now, Mr. Bosecker, I think at this time we should move to Exhibit Thirteen and ask you to explain that to the Commission.

Now will you refer to Exhibit Thirteen and explain this?

A. Exhibit Number Thirteen is basically the same calculations but I have taken out the Getty 35 State No. 1 because its primary gas production, its remaining reserves, its ultimate producible reserves, and for that matter, the original gas in place has not been defined in the same manner as the other wells that have already been depleted.

Also, the Llano Government A No. 1, the well to the south, in checking the annual report of the New Mexico Engineering Committee, I find that the primary gas production for that well is 2,148,588, as compared to 1,500,000.

In checking the current monthly production I find that the well is also producing and I've gone through and determined the remaining reserves, 601,412 and recalculated the Llano Government A No. 1 to come up with original gas in place of 3,481,250.

Going through the same calculations that Llano did, it shows that that well, which is not confined on one side, its drainage radius has increased from, let's see, I'll have to refer to the old one, from 461 to 836.

The average well has gone from 327 to 427, keeping in mind that these wells are still confined, closely confined, by sealing faults on both sides.

Q. Now, Mr. Bosecker, will you refer to what has been marked for identification as Getty's Exhibit Number Fourteen and explain this to the Commission?

MR. CARR: May it please the Commission, again I point out that the base exhibit is Llano's Exhibit B from the prior hearing, and so that the Commission will understand why we have elected to use this exhibit as the base exhibit, I agreed with Mr. Kellahin that we would not introduce anything new by way of seismic data this time that had not been previously introduced. To be certain that we abide by that agreement, we at that time determined that we would use the Llano Exhibit B as our base exhibit, or the exhibit from which we would work.

Q. Okay, Mr. Bosecker, would you explain it?

A. I believe this is Exhibit Number Fourteen.

Q. That's correct.

A. Exhibit Number Fourteen graphically depicts what has been submitted in the previous exhibits.

The Getty 35 State No. 1 shows the drainage radius as calculated by Llano as what they think the Getty 35 State No. 1 can drain, 262 acres.

The four storage wells, the 1, 2, 3, and 4, shows that graphically the drainage area that has been on the previous exhibit as submitted by Llano and submitted here today.

Now, on the Llano Government A No. 1, the red curve on the inside is what Llano initially submitted. The green curve is what the well has produced to date. The purple curve is what I've determined it will produce when it reaches its economic limit.

I'd like to point out that on an exhibit like this, you understand that two wells cannot drain the same area. In other words, on the top row, Well No. 2 and Well No. 3 cannot drain the area that is included by both of those circles. So the gas that these wells produce has to be produced, say, from the north or to the east if the fault is moved over further to the east.

Q. Will you now refer to what has been marked as Exhibit Number Fifteen?

Mr. Bosecker, will you first explain what is Exhibit Number Fifteen?

A. Exhibit Number Fifteen is simply a Xeroxed copy of a prior exhibit submitted in Case 4895 and 4896.

This was Exhibit Number Four. This was an exhibit made back in 1972 at the time that Llano was appearing before the Commission to determine remaining reserves and to obtain approval to get a gas storage project.

Q. Will you review it now for the Commission?

A. I simply just meant to point out that these drainage area calculations are very sensitive. Now, the footages that were used by Llano in March of '79 were footages that have recently -- or that I just introduced. These footages are somewhat different and -- and so what I've attempted to do is to see how the footages vary the drainage area curve.

Using the footages as testified to in 1972, this is the drainage area recalculated.

Q. And you're now referring to what has been marked for identification as Exhibit Number Sixteen.

A. That is correct.

Q. Will you summarize that data for the Commission?

A. Just one second. Exhibit Number Sixteen uses the -- the prior thicknesses for the various wells. Example, now 20.2 as compared to 24; 15.4 is compared to 20; 5.7 as compared to 15; 8.3 as compared to 16; and 6.6 as compared to 6.

A decrease in the thickness makes the

drainage area much wider, and as you can see, the wells have increased substantially the area of drainage.

As an example, the Llano GRN Unit Well No. 4 has gone from 285 calculated drainage acres to 549, even though it is still being confined by the faults. In other words, the drainage radius has to be cigar-shaped to produce that gas.

The rock characteristics are such that you can drain for a great distance.

Another example is the Llano No. 3 Well. It increases it from 246 to 653. The footages have been increased since this first exhibit 163 percent, and this makes a change in the drainage area. In other words, going from a small thickness to a large thickness it decreases the drainage area.

Q. Is it a fair characterization of the evidence that you've presented that no matter which data we look at that's been previously submitted by Llano, that on careful review they all support 640-acre areas of drainage?

A. Definitely.

Q. Will you now refer to what has been marked for identification as Exhibit Number Seventeen?

A. Exhibit Number Seventeen is a graphical depiction of this data that I've just discussed. It is

simply showing how the drainage areas have increased if in fact the footages are correct.

Q. The footages as Llano represented in '74?

A. That is correct, '73.

You can see there's great overlapping. There is no way that Well No. 3 in Section 33 can drain across that fault, so again, the drainage that that well has already produced down to its economic limit, has to have come from the north.

Q. And what does this say to you about the rock characteristics in the area?

A. It says that the rock characteristics are such that it will support 640-acre spacing.

One thing that I did not mention before that I would like to mention, Shell, when they applied before the Commission for 640-acre spacing on this field, in Case Number 3337, ran an interference test, and this was introduced as evidence and I have a Xeroxed copy of it here.

To give you an idea of the rock characteristics, I'd like to read a portion of it to you, and that interference test was run to assist in determining the areal extent of the gas reservoir and as evidence that one well would drain 640 acres.

Now on the current maps this interference

test was between the Llano No. 1 and the Llano No. 4. Both wells had been shut in for a long time and reading on, the conditions for the interference test were as follows: The No. 1 Well was flowed at a rate of 16 cubic feet per day for 6 days, while the shut-in pressure was monitored in the offset well, which is now the No. 4, 3645 feet away.

Now to support 640-acre drainage, you have to drain approximately a radius of 2980, that's approximately, within 10 feet, I believe.

Now these two wells were 3645 feet apart. The pressure started declining in the shut-in well approximately 10 hours after the flow commenced in the No. 1 Well, and the pressure in the shut-in well continued to drop throughout the test. At termination of the flow period, 157 hours, pressure had declined 57 pounds. Now this is again across the period of 3645 feet.

My point is this. The rock characteristics of this reservoir, which is the same on both sides of this fault, is such that to support 640-acre spacing.

The reason that this field did not produce more gas was because of confining, sealing faults.

Q. Mr. Bosecker, will you now refer to what has been marked for identification as Exhibit Number Eighteen and explain what this is and what it shows?

A. Exhibit Number Eighteen, this deals with

three sections, Section 35 of Getty, Section 34 of Llano, Section 33 of Llano.

The red rings depict the earlier, March '79, testimony showing the drainage. Example, the Getty 35 by Llano stated to drain 262 acres maximum.

Their No. 2 Well is shown in red and I have to refer back to see what the actual footage was and compare the acres they drained, but anyway, you can see -- see the size of the circle, and also the No. 3 Well. With the No. 2 ring is the Llano '72 data as far as net pay, showing how the drainage increased when you decrease the net pay.

The No. 3 ring, the orange ring on the No. 2 Well, was some other testimony on net pay presented by Llano, saying that the effective net pay in the No. 2 Well in the same case -- now that's not the pay that was logged that was on the Isopach map, but that is the effective pay that they calculated, was 10.3 feet.

Again, graphically this is a depiction of -- of drainage area showing that these wells have good rock characteristics, that to drain gas [illegible] curves cannot overlap or go across faults, so they have to go a long distance of cigar shape, so to speak, or the faults would have had to have been further away from the wells. We know the fault to the west is -- is approximately -- or very closely

defined. The fault to the east is not nearly as closely defined.

Q. Will you now refer to what has been marked for identification as Exhibit Number 19 and explain this to the Commission?

A. Exhibit Number Nineteen is the Getty Two State Well No. 1, actually a Horner plot; plotted on the left was bottom hole pressure in psig at 13,041 feet. To the right is a log of T-plus-delta T-over-delta T. This plot -- I would also like to submit the next exhibit at the same time. It shows the analysis of this plot, Exhibit Number Twenty.

This bottom hole pressure build-up test of this well was run shortly after completion. The plot reflects a two-layer reservoir performance as can be seen by the formation of two parallel lines that are drawn on the exhibit, and the change of slope to get from the one parallel line to the other.

P*, the initial reservoir pressure, was 8270 psig. It also indicates no visible boundary. Permeability, or Kh is 67.5 millidarcy feet. And it is our opinion that this type of Kh is a relatively high number, substantial to drain 640-acre spacing.

Q. Mr. Bosecker, will you now refer to Exhibits Twenty-one and Twenty-two and summarize these for

the Commission?

A. Twenty-one is the Getty Two State bottom hole pressure, taken substantially after completion in December of '78. Again, Twenty-one is a Horner plot; Twenty-two being the data sheet that analyzes this plot.

You can see a substantial change in the characteristics of the curve. This is more in semi-steady state condition, P* being 7850. It does not show a fault. The permeability has increased, or the Kh has increased slightly from the one example to the other, to 73.5 millidarcy feet.

Again, we feel that based upon reservoir parameters in the area of the wellbore are such that they could effectively drain 640 acres.

Q. Will you now refer to what is Exhibit Twenty-three and Twenty-four and again summarize these for the Commission?

A. This is Getty's 35 State No. 1, a pressure build-up on -- on this well shortly after completion, showing a P*, initial reservoir pressure, at this point in time of 7460, indicating the permeability, or kh, is 175.6, higher than the other well. It indicates no boundary at the present that can be seen; that the permeability is good; that the reservoir parameters in the area of the wellbore should effectively deplete a 640-acre proration unit.

Q. Will you now refer to Getty's Exhibit Number Twenty-five?

A. To save a little time, let's do Twenty-five and Twenty-six at the same time.

Twenty-five is a tabulation of the production on the Getty Two State, showing the condensate production, the gas production by month since first production in May of '78 through May 1st, '79. The well has produced 533,541 Mcf; 4,346 barrels of condensate.

This is depicted on the next exhibit, Exhibit Twenty-six in plotted form. I would like to point out the current producing rate of the well. The well is producing 1,700 Mcf per day with 16 barrels of condensate, 8 barrels of water, on a 7/64th inch choke. The flowing tubing pressure is 3,150 pounds.

I would like to also point out that to the best of my knowledge the line pressure of Llano's line in this area is from 350 to 500 pounds; therefore, you can see that this well is being produced with a choke but it is capable of a higher rate than what it is producing.

Q. Now refer to Exhibit Number Twenty-seven and explain this to the Commission.

A. Well, first of all, we have -- Twenty-seven is part of the Two State; better do that separately.

This is a plot of the same well, of the

same data but it is broken, it is more detailed as far as time. You can see that this is a record of our sales of gas produced and condensate produced, and it shows that the condensate really did not start producing until, oh, in July. This is an indication that we feel that indicates that some of the zones that appeared to be low in productivity were cleaning up.

Q. Would you now refer to what has been marked as Exhibit Number Twenty-eight and review this for the Commission?

Mr. Bosecker, will you refer to Exhibits Number Twenty-eight and Twenty-nine and explain these?

A. Twenty-eight and Twenty-nine are the same type of exhibits as were recently introduced in the Two State, showing the Getty 35 State condensate and gas production by month, with a cumulative production through May 1st of '79 of 350,223 Mcf of gas and 1,547 barrels.

Also note the current production rate of this well. We're flowing this well from 3.7 to 3.9 million per day, 17 barrels of condensate, 65 barrels of water, on a 12/64th inch choke. The flowing tubing pressure is 4,400 psi tubing pressure.

Again, this well is being restricted by a choke because the line pressure is in the neighborhood of 350 to 500.

Q. Now, Mr. Bosecker, what conclusions can you draw about the reservoir from the data you have presented here today?

A. The rock characteristics are such that there is communication in the reservoir on the east side of the fault and on the west side of the fault; that one well can effectively drain 640-acre spacing; that --

Q. Do you consider this to be a typical Morrow Sand?

A. No, I do not.

Q. How so?

A. Well, a lot of the Morrow Sands in southeastern New Mexico do not have permeabilities like this, as shown from -- from this data on these two wells, plus the data on the storage wells, plus the data from Shell showing that 3,645 feet away you get a response in 10 hours, indicates that it's not a typical Morrow Sand.

Q. Is it safe to say that in this reservoir there appears to be continuity of the sand from well to well?

A. Yes.

Q. Mr. Bosecker, Getty is producing two wells, the 35 and the Getty Two State, in Sections 35 and 2. Do you believe that these two sections have been reasonably proven productive of hydrocarbons?

A. Yes, I have.

Q. What acreage are you requesting the Commission include within the new pool which you are proposing here today?

A. The area of these two wells that are reasonably proven productive of hydrocarbons.

Q. Being Sections 35 and Section 2?

A. That is correct.

Q. Mr. Bosecker, if special pool rules were adopted providing 640-acre spacing, would this in your opinion avoid the drilling of unnecessary wells, thereby preventing waste?

A. Yes, it will.

Q. In your opinion would granting the application of Getty reduce the risk that would result from the drilling of an excessive number of wells?

A. Yes.

Q. Are all wells that are currently producing in the area drilled so as to conform to your proposed spacing pattern?

A. All of Getty's wells are but there is a location and a well that I think has been spudded in Section 34.

Q. That's a Llano well?

A. Yes. It is 660 feet from the lease line rather than 1650.

Q. Now what well location requirements are you proposing for the new pool?

A. 1650 feet from the outer boundary.

Q. And have you drilled all of the Getty wells in this area in a fashion consistent with this proposal?

A. Yes, we have.

Q. Do you have a -- and it is your recommendation then that -- to the Commission that wells be located 1650 from the outer boundaries of the producing unit?

A. Yes.

Q. Mr. Bosecker, in your opinion will granting the application of Getty protect correlative rights and be in the best interests of conservation?

A. Yes.

Q. Now, at this time, Mr. Bosecker, I'd like to ask you several questions which relate primarily to Llano's request for an unorthodox well location.

How long has Getty been working in this general area, developing the Morrow Sand in the Grama Ridge area?

A. At least since the mid of '77, 1977.

Q. And have all your wells been drilled at standard locations consistent with the rules in effect for

the area?

A. Yes.

Q. And where is Llano's proposed location of the well which they are now drilling?

A. If they are drilling it, and I think that they are, it's 660 feet from the east line of Section 34 and 1650 feet from the south line of Section 34.

Q. How much closer to Getty's lease are they than if they had drilled at the standard location?

A. It would be 990 feet.

Q. Now, what effect is this going to have on Getty?

A. It would have an adverse effect with one well producing 660 feet from the lease line, with the other well being a legal location 1650 feet.

Q. Assuming that the Llano well is completed in the same Morrow Sand as the Getty well in Section 35, do you believe that Getty will be able to protect itself with counter drainage from the drainage which occurs from the Llano well?

A. If the Llano well is 660 feet from the lease line, no.

Q. Could you drill another well in there and protect your correlative rights?

A. We could drill another well on the 640-

acre block and we could drill the second well 660 feet from the lease line, but there is no way to move the well that we've already drilled legally, that is 1650.

Q. And would this be an efficient way to develop that 640-acre section? By drilling a second well in the --

A. Well, with these rock characteristics there is no need to drill a second well. If you've got rocks that can transmit a pressure response in a matter of 10 hours an additional well is an economic waste.

Q. I believe you've prepared a couple of exhibits which relate to this particular part of the case. They will be marked Getty's Exhibits Thirty-one and Thirty-two.

We plan to offer Exhibit Number Thirty with another witness.

MR. Bosecker, will you please refer to what has been marked for identification as Getty's Exhibit Number Thirty-one and explain to the Commission what it is and what it shows?

A. Okay. Exhibit Number One is a map that shows first of all red circles.

MR. RAMEY: Thirty-one, Exhibit Thirty-one?

MR. CARR: That's right.

A. These red circles have a radius of 1650 feet, which is the radius of the existing field rules now in this area and the prior rules when the field was in the Grama Ridge Morrow Field.

It shows the location of the Getty Two State, our first well, drilled and completed with the circle fully in our lease and our proration unit; the same being true of the Getty 35 State No. 1, and also true of the Getty 36 No. 1, which is now drilling.

Also included in red is a proposed unorthodox well location of Llano in Section 34. This well also has a red circle with a radius of 1650 feet around it.

Please note that a portion of this red circle overlaps on the Getty lease line; that -- and there is not a compensating overlap for the Getty 35 State No. 2.

In addition to that is a blue -- a blue arc. Now, everyone believes and has seen evidence, and agrees that somewhere between the Getty 35 State No. 1 and the Llano No. 2 Storage Well is a fault, a sealing fault. The exact location of this fault is not known, but if the fault is as Llano depicted it in this map, there is 277 productive acres in Section 34 east of that fault. This number was obtained by planimetering this map of Llano's.

Now what I have done with this blue arc, I planimetered this area. It's kind of a trial and erro

type deal, but encompassing the blue arc and the fault is 640 acres of drainage, showing that if a well is drilled and if it drains 640 acres, and if the fault is where it is shown on this map, what acreage that well would affect.

Q. Now, Mr. Bosecker, would you refer to what has been marked for identification as Getty Exhibit Number Thirty-two and explain this to the Commission?

A. Exhibit Number Thirty-two shows two wells locations in Section 34; one that would be a legal location, or, well, one that is 1650 from the south and east lines, and one that is 660 from the east and 1650 from the south.

Q. And what does that show?

A. There is a difference in the drainage area of 640 acres. These two circles have a radius of drainage of -- or have an area of 640 acres. That's about 2,980 feet radius.

As you can see, there is an area that the well that would be 660 feet could drain further than the well that is located 1650 feet from the lease line.

Q. Now how much more does the area of drainage extend into Section 35 with the proposed location than it would if the well had been drilled at a standard location?

A. 124 acres into Getty acreage.

Q. That's the number of acres of drainage

they gain in Section 35 by the unorthodox location, is that correct?

A. That is correct.

Q. And I believe you stated that their well is actually 990 feet closer to the lease line than a standard location would be?

A. That is correct.

Q. A standard location being the location under the existing rules for this area?

A. Uh-huh. This exhibit has two well locations, one being 1650 from the lease line; one, 660.

Q. Is the proposed location of Llano, or the in fact location where they are drilling their well, also non-standard from a north-south point of view?

A. It is, also.

Q. By how much?

A. I believe 330 feet.

Q. Mr. Bosecker, if the pool rules were changed to 320-acre spacing and no penalty is assessed on the production of the Llano well by this Commission, what effect will it have on Getty?

A. Well, Getty having a well 1650 feet away as compared to 650, will not be in the same position as far as drainage.

Q. If the unorthodox location sought by Llano

is approved and no penalty is assessed, will Getty's correlative rights be impaired?

A. Yes.

Q. Are you familiar with the formula that has been used by the New Mexico Oil Conservation Commission in assessing a penalty for unorthodox well locations?

A. Yes.

Q. Do you believe if a similar penalty was imposed on the Llano well that it would protect you from the damage you incur as a result of the unorthodox location?

A. As a result of the unorthodox location, yes.

Q. Now, Mr. Bosecker, Llano is also here today seeking a non-standard proration unit of 320 acres. If this application is granted and no penalty is assigned for the non-standard -- non-standard number of acres to dedicate to the well, what effect will this have on Getty?

A. Well, it would adversely affect Getty's position.

Q. And how so?

A. Well, with one operator dedicating 640 productive acres and another operator dedicating less productive acres, both having wells with unrestricted production rates, one would have an unfair advantage over the other.

Q. Do you believe that the production should also be penalized from this well based on the number of productive acres they're proposing to dedicate to the well?

A. Yes, I do.

Q. Without this penalty do you believe there is any way that Getty can effectively protect its correlative rights?

A. No.

Q. Do you believe granting the applications of Llano without a penalty would impair your correlative rights?

A. Yes.

Q. Mr. Bosecker, is this area prorated?

A. No.

Q. How do you recommend that any penalty assessed on this well be made effective?

A. It could be based on witnessed deliverability tests on the subject well. In other words, if there was a 50 percent penalty, or a 75 percent penalty, there could be a semi-annual witnessed deliverability test that could be witnessed by the Commission or any interested operators in the field.

Q. You are aware that the Commission has approved similar procedures in the past?

A. Yes, I am.

Q. Now, Mr. Bosecker, to avoid any misunderstanding on this, is it your testimony that Llano has no right to produce whatever reserves it has under Section 34?

A. No, it is not my testimony.

Q. And is it a fair characterization of your testimony that all you're asking the Commission to do in regard to the unorthodox location and non-standard proration unit is not put you in a position where you cannot protect your correlative rights?

A. That is correct.

Q. Do you have anything further to add to your testimony?

A. No, I don't believe so.

Q. Were Exhibits One through Thirty and Thirty-one and Thirty-two either prepared by you or have you reviewed them and can you testify as to their accuracy for the purposes for which they were introduced?

A. Yes, I can.

MR. CARR: At this time, may it please the Commission, we would offer Exhibits One through Thirty, and Thirty-one and Thirty-two.

MR. NUTTER: You're not through Thirty yet.

MR. CARR: One through Twenty-nine and

Thirty-one and Thirty-two.

MR. KELLAHIN: If the Commission please, I have objections to certain of the exhibits and I would like to have the Division reserve introduction on exhibits Fourteen, Fifteen, Sixteen, Seventeen, Twenty, Twenty-two, Twenty-four, until after I've had a chance to cross examine this witness on those exhibits and to voir dire him about the contents of it.

With the exception of those exhibits, I have no objection to the other exhibits.

MR. RAMEY: Okay, Exhibits One through Thirteen, Eighteen, Nineteen, Twenty-one, Twenty-three, and Twenty-five through Twenty-nine, and Thirty-one and Thirty-two will be admitted at this time.

One quick question. You gave a number of productive acres in the Llano tract in Section 34. What was that figure again?

A. 277, and it's on that next to last exhibit. Also, in Section 3 on the east side of the fault, planimetered as 275 for that.

MR. RAMEY: Let's have a fifteen minute recess.

(Thereupon a recess was taken.)

MR. RAMEY: The hearing will come to order

Any questions of Mr. Bosecker?

MR. KELLAHIN: If you please, Mr. Ramey.

MR. RAMEY: Mr. Kellahin.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Bosecker, would you please refer to Getty's Exhibit Number One for a moment?

Do you recall when the Commission originally established the 640-acre spacing for the Grama Ridge Morrow Pool?

A. Approximately 1965 in, I think -- just one second. I believe I have that. Or very close to it.

It was Case Number 3337 and the date of the exhibit presented by Shell was November 23rd, 1965, so that's not an exact answer, but approximate.

Q. And you testified before Examiner Nutter on March 14th, 1979, in a Division case in which Llano, Inc. requested the recision of those pool rules to re-establish spacing on 320 acres, did you not?

A. Yes.

Q. And at that hearing Getty did or did not oppose the reduction of spacing for this particular pool? What was your position at that hearing?

A. If I remember correctly, reduction of

spacing was not even asked for. What was asked for by Llano was to change the field rules from 640 and 1650 from the lease line to 320 and 660 from the lease line.

Q. The Division approved that application, did it not? You're aware of Division Order Number R-5995 entered on May 2nd, 1979, are you not?

A. It did not fully approve it, no.

Q. It approved the Grama Ridge Morrow Pool reduction in spacing from 640 to 320 for an area confined between the two fault lines we've been discussing, did it not?

A. Yes, it did.

Q. And left on a temporary basis what to do with the bounds of that pool east of the east fault line.

A. It placed that acreage east of the fault on 640 acres, 1650 from the lease line, on a temporary basis.

Q. What else did that order provide, do you recall?

A. I believe so.

Q. It also provided, did it not, that if Getty did not come forward within a certain period of time that the spacing for that particular area would be reduced to 320 acres. That was one of the provisions of the order, wasn't it?

A. Yes, it was.

Q. And that's why you're here today, isn't it?

A. Part of it.

Q. Now, Getty has not taken an appeal of Commission Order Number R-5995, have they?

A. That is correct.

Q. In fact, Getty does not intend to take an appeal on that, do they?

A. That is correct. We feel that the reservoir can reasonably be separated as a result of the fault.

Q. Do you think the Commission established a reasonable separation based upon that fault in Order Number R-5995?

A. You mean geographic location of the two fields?

Q. Yes.

A. At this point in time, with what limited knowledge we have of the location of the fault, we, being everyone, it is a reasonable location of the division.

Q. Well, you have absolutely no question that there is a fault that runs north and south separating the Getty wells in 35 and in Section 2 from the Llano storage wells in Section 34 and 3.

A. I have no question about a fault. It may run more parallel to the major fault and may not run right up the half section line.

Q. You have incorporated in your testimony here today certain of Llano's exhibits, including Getty Exhibit Number Ten, which Is Llano's structure contour on the top of the Morrow Clastics, indicating that the location for that fault line is the approximate center of Sections 34 and 3, does that not -- is that not true?

A. Exhibit Number Ten, you say?

Q. Yes, sir.

A. Exhibit Number Ten shows a fault on the east side of the storage wells. Its exact location, even as testified by Llano in the March hearing, is an estimate.

Q. Yes, sir. I'm concerned about your testimony, Mr. Bosecker.

A. Bosecker.

Q. Sir?

A. Bosecker.

Q. Bosecker, Mr. Bosecker. You've incorporated Llano's exhibit in your testimony and you've not produced a different structural contour or any other information indicating that the fault is other than as depicted on Exhibit Number Ten. That's true, is it not?

A. We have not introduced another structure map and this was a result of not showing any geophysics, a decision that was agreed upon.

Q. The geophysics information you rely -- that you allude to is seismic data that is in Getty's possession and not in Llano's possession, isn't that true?

A. That's correct.

Q. It's your seismic data.

A. Yes.

Q. All right. So you're not willing to introduce any evidence here today that indicates that that fault line is any farther east than is depicted on Exhibit Number Ten.

A. That is correct.

Q. All right. Now, let's look at Exhibit Number One again, if you please.

You indicated in your testimony with regards to that exhibit that the three Getty wells, the ones located in Sections 35, one drilling now in 36, and the one first completed in Section 2, all those are at a standard location if that acreage is spaced on 640 acres. That was your testimony, was it not?

A. Well, at the time that each location was asked for it was a standard location, and it still is a standard location.

Q. If the spacing is 640 those would be standard locations.

A. Well, it is 640 at this moment.

Q. For 640-acre spacing those are standard locations.

A. That's true.

Q. All right, they are also standard locations if this was re-spaced on 320 acres, is that not true?

A. That is true.

Q. All right. Now what is Getty's ownership in Section 2? What percentage does Getty have?

A. Getty has a working interest ownership and I think there are three partners in it, Sabine, Belco, and Southland. I do not know our exact ownership. This isn't something I'm -- I'm a reservoir engineer and I don't keep track of that kind of stuff.

Q. Okay, how about Phillips Petroleum Company, do they have an interest in Section 2?

A. I don't know.

Q. Do they have an interest in Section 35?

A. Not to my knowledge, but they possibly do. They do have an interest in Section 36.

Q. And that's shown on your exhibit, isn't it?

A. Yes.

Q. It appears from your Exhibit Number One that Belco has the north half of Section 35.

A. It -- Belring (sic) is what it says on here.

Q. All right.

Do you know that that's Belco's drilling partner?

A. No.

Q. Okay. Getty's interest in Section 35 is 50 percent interest, is it not?

A. I don't know.

Q. As a matter of fact, when Getty drilled the well, the Morrow well in Section 35, certain of your working interest owners went non-consent in that well, did they not?

A. Yes, they did. That I do know.

Q. All right, sir. You do know?

A. Well, I do know that working interest owners went non-consent.

Q. Do you know which ones went non-consent?

A. Well, to the best of my knowledge, I know of three working interest owners in Section 35 that are not Getty.

Q. All right.

A. One is Belco. One is Southland, and the

other one is Sabine.

Q. Your agreement with the other working interest owners in Section 35 provided that those owners, if they did not join you in the drilling of the well and went non-consent, would incur a 300 percent penalty. That's true, isn't it?

A. That's what I've heard, yes.

Q. And the reason those working interest owners went non-consent in the Getty well in Section 35 is because of the poor quality of the Getty well in Section Number 2, isn't that correct?

A. You could probably construe that but, you know, each company has different requirements.

Q. But to your own knowledge, Mr. Bosecker --

A. I would think that's a logical assumption. I cannot testify to that as being the fact.

Q. But you have no evidence to the contrary, do you?

A. No.

Q. Now when was the Getty Well No. 2 completed?

MR. RAMEY: Is that the Two State Well you're asking about?

Q. I'm sorry.

MR. RAMEY: Or is it a separate well?

Q. It's the Getty Two State Well in Section Number 2.

MR. RAMEY: Okay, thank you.

A. February 13th, 1978. That was the date of the 4-point test and the date shown on the Form C-105.

Q. If I understood your direct testimony, Mr. Bosecker, you were basing your conclusion that the wells east of this fault line will drain 640 acres based upon certain geologic information that you had studied. You in fact have studied some geological information with regards to your testimony.

A. I'm familiar, yes.

Q. Mr. Carr asked you in one of the last questions when you were concluding and summarizing your testimony, he asked you whether or not this was the typical Morrow Sand encountered in southeastern New Mexico, and you answered that it was not. All right, in what ways does this geologically differ from the typical lenticular channel Morrow Sands that's often encountered in southeastern New Mexico?

A. This deposit is more extensive. It has higher quality of pay. As -- as we have shown, the kh is relatively high. As Llano and Shell have shown, there is rapid communication between wells.

Q. Is it your testimony that the Morrow

formation in this area is a deltaic deposition rather than a lenticular channel deposition?

A. It is not a channel -- a channel deposit. A channel deposit is very narrow, changes abruptly in direction, and does -- it does not appear that this is what we have here.

Q. Is this a deltaic deposition?

A. Well, there are several different things it could be. There are barrier bars, deltaic. Our next witness, I think, can add -- add some to that.

Q. Was it not your testimony before the Examiner on March 14th, 1979 on page 52 of that transcript, you answered, "These sands are thought to represent various sand environments associated with deltaic and shallow marine -- shallow complexes?"

A. Shallow marine complexes, yes.

Q. All right.

And then you went on to list a number of factors upon which you based that conclusion, to indicate that this was not a typical lenticular channel deposit of the Morrow formation. Do you recall that testimony?

A. Somewhat, yes.

Q. Would you tell us what factors you used, what geological factors you used to reach the conclusion that this was a deltaic deposition?

A. One is the extent. The other was communication. If you had channel deposits you frequently have many reservoirs, sometimes stacked right on top of each other. You do not have communication 3,645 feet from one other well, and widespread communication.

Channels are usually narrow. They sometimes are very long.

Q. One of the factors you used was to describe the color of the sand deposit as a difference between deltaic and lenticular deposition. You described the deltaic deposition as being gray to gray/white in color.

What would be the color of a lenticular deposition?

A. I believe that I stated the nature of the samples but I -- that -- that appeared in the well.

I believe I have my testimony here. Okay, the statement I made was the sands are characteristically gray to gray/white in color.

Q. All right, let's stop there for a moment, Mr. Bosecker, and have you describe for me the type of color you would encounter in a lenticular deposition.

A. Well, it may be the same color. I am just stating the color of the sand that appeared in that well.

Q. Okay. You also indicated that the sand

is poor to well sorted, did you not?

A. Yes.

Q. What would be the --

A. Coarse to fine grain.

Q. Coarse to fine grained. How would you --

A. Not --

Q. Excuse me, let's stop at that point and let me ask you how you compare that kind of information from the sand properties of this deltaic deposition to a lenticular deposition?

A. Again I'll state that I told you what the sands appeared to be from this well.

Q. You also went on to testify that the porosities ranged from 5 to 17 percent with an average in a commercial well of 8 to 11 percent.

What would be the porosity ranges encountered in a lenticular deposition?

A. Obviously, you could have 8 to 11 percent.

Q. All right, as a matter of fact, all those factors you indicated in your testimony back in March would apply regardless of whether this was a deltaic or a lenticular deposition.

A. The factors as far as porosity and color, sorting, size of grains, I think you know those could be in a channel deposit or a deltaic deposit, but that our next

witness can elaborate more fully on that, if you would like.

Q. Now let's look at your cross section, if you don't mind. It's cross section, Exhibit Number Seven.

Now you've indicated just now, Mr. Bosecker, that this particular area, you thought you were encountering several Morrow reservoirs that were stacked one on top of another? Is that not what you said?

A. When?

Q. Just now when we were describing the general geologic characteristics of this particular Morrow formation.

A. I don't think I said that.

Q. All right. Let's look at your Exhibit Number Seven and the Getty Well No. 35 in Section 35 is the well on the far right of the cross section, is that -- that's right, isn't it?

A. Uh-huh.

Q. And the next well proceeding left is the storage well in Section 34.

A. That's the No. 2.

Q. All right. And the next one across is going to be --

A. No. 3 storage well.

Q. No. 3 storage well.

And then the last one, you picked up on

the Pogo Well up in Section 20.

A. That is correct.

Q. Looking at your log on the Getty 35 Well, how many different distinct Morrow sands do you find below the top of the Morrow Clastic marker?

A. Several. Several members that carry porosity.

Q. All right. Starting with the lowest member, would you identify the top and the bottom of that member?

A. Well, the lowest member that we have marked here, the bottom appears to be at around 13,100. I cannot read the exact footages off of this.

Q. Okay. Where is the next sand body in this log?

A. You mean that we have marked on this exhibit?

Q. Yes.

A. There is one, the next one that is marked is around 13,045, I would say.

Q. That appears to be a rather thin Morrow Sand about 13,005, 13,045, something like that? That's the second one?

A. Now, these lines on here were drawn for correlation purposes. There are other sand streaks, you

know, but these --

Q. All right, what cutoff have you used to determine whether you were going to place these Morrow Sand stringers on your exhibit?

A. The ones that were very clean and had not so much shale. In other words, low on radioactivity.

Q. Is there some kind of number that you use as a cutoff?

A. No. You can look at it on the lefthand side of the log.

Q. All right.

A. High radioactivity goes to the right; low radioactivity goes to the left, and the gamma ray is very good for correlation purposes.

Q. Now you've used only those sands -- identified only those sands stringers that you believe are the ones that continue throughout this particular area.

A. No, I wouldn't say that these are the only ones. These were good, plain ones that a cross section should be built from.

Q. Okay. Above the second one there appears to be another sand stringer just above the 13,000 foot mark. Is that another one?

A. Yeah.

Q. All right.

A. About at 12,090, I guess.

Q. Well, 12,990.

A. 12,990, thank you.

Q. All right. Let's look back up farther now at 12,900.

A. Yes.

Q. And just below that number is a fourth Morrow stringer.

A. This particular Morrow stringer is one that is a very good correlation across the field and this is the one where the bulk of the reserves are in.

Q. Okay.

A. Now this, you know, this is an estimate, but that is my opinion.

Q. Okay.

A. And that's the one that we're really talking about.

Q. The next line up there I guess is the top of the Morrow Clastics. That's your marker?

A. Yes.

Q. And above that you show what looks like another Morrow Sand above the top of the marker?

A. That is correct.

Q. All right. Let me label that one number five just for simplicity's sake.

A. Okay.

Q. Let's go across to the Shell Well in Section 34, the next one on your cross section, and have you correlate for me those same five Morrow Sand zones.

We can see, can we not, that in the cross section, that the lowest line in this particular well now because of the fault appears somewhat higher from the lowest Morrow Sand in the No. 35 Well.

A. I don't know that that's a true statement. I'd need a T-square or something.

I think the one in 35 is slightly higher. The fault is downthrown to the east but you're gaining structure as you go to the east, so the Getty 35 State at that point is higher than -- than the Shell well is.

Q. All right. What is the number of feet of throw to this fault on the east side? Do you know?

A. Not exactly.

Q. Do you have an estimate?

A. If I remember, Llano introduced an exhibit showing either 225 or 235 feet, or 265. It was 200 and something.

Q. You have no disagreement with that figure, do you?

A. No.

Q. Now, as you go across to the old Shell

Well in Section 33, the No. 2 -- well, this is Llano storage well No. 3, I think it is, yeah, it's the storage well No. 3 in Section 33, and it is the third log going from right to left.

Would you again identify those Morrow pay intervals that you say correlate across between the logs of the three wells?

The lowest one again is around 13,200 feet?

A. Yes. There are several in there.

Q. Okay.

A. And there is some changing between that well and the Shell well but the major ones you can see go across there.

Q. All right. Now if you'll identify the fourth one up in that well and compare it to the fourth one up in the Getty 35 Well, which you say is the primary producing sand in the 35 Well, it appears, does it not, that the sand in the well located, the No. 3 Well, has thinned at that point?

A. There's been some change across there. That's a period of a couple miles.

Q. Now let's go back and look at the Getty 35 Well and have you identify for me which, beginning with the lowest, which of these Morrow Sands you've tested and

produced, or tested or produced.

A. Could we go to the two well exhibit and perforations are on there?

Q. All right.

A. The 35 Well is on the left. Now, let me remind you that the long marks are perforations. The little, short ones were placed on the log by the logging company, and I believe that stands for, is used for a calculation of the cement, you know, the caliper.

Q. All right. In the No. 35 Well, Mr. Bosecker, would you identify for us the Morrow Sand that you describe on Exhibit Number Seven as being the lowest Morrow Sand and which we've numbered number one?

A. I think that would take some time to correlate these and see if they go that far across.

It's very easily recognizable, this top one, and then --

Q. The top one, you mean the one above the top of the Morrow Clastics marker?

A. No, below -- the top one below the Morrow Clastics marker.

Q. That is the number four line that you referred to as being the primary producing sand in the 35 Well?

A. That is the primary producing sand probably

in the area, but that's a very good looking sand, and you can see that it is in the Two State, also.

Q. Well, looking at the perforations, it shows that you perforated that interval.

A. Yes.

Q. Is the 35 Well producing from any of the other Morrow Sands?

A. Yes, it is, and I can look to see where the exact perforations are, if you would like. They should be on there but I'm having a hard time seeing them with those other lines.

Would you like for me to read them?

Q. I think we ought to put them on here.

A. I think --

Q. Now let me ask you this. On the 35 Well, this well has only been perforated one time in one series of perforations, is that right?

A. That is correct. Now these perforations may be off of a different log than this one here, so --

Q. I understand, but --

A. -- footages may not be exactly right when you, you know, you run three logs and they may be off a dab or two.

Q. Looking at your 35 Well, tell me, starting with the lowest -- the lowest perforations where you've

perforated that well.

A. 13,102 feet. Apparently we're using another log that we recorded these perforations on.

Q. All right, go ahead.

A. Then at 100, 98, 94, 92, 85, 81, 71.

Q. Okay.

A. Then going on up the hole, 12,924, 22, 20, 18, 16, 14, 11, 9, and 7.

Q. All right. That's all of them, right?

A. To the best of my knowledge that's all of them, in this zone.

Q. Well, you've tested a lower zone down here at the 13,100 foot level and perforated it one, two, three, four, five, six, seven, eight, nine times in that sand section. What production did you receive from that sand section?

A. I don't have the day-by-day record and I do not know that this was done separate to the upper perforations.

Q. Okay. What was your initial bottom hole pressure when the 35 Well was completed?

A. In this well?

Q. 7,460 pounds, wasn't it?

A. Okay, on the C-122 the bottom hole pressure, now I believe this is absolute, was reported to be

7,468.2 pounds.

Q. Okay. Now let's look at your Exhibit Number Nine and look at the Getty Two State No. 1 Well in Section 2.

A. Exhibit Number Nine, that's it.

Q. It's just the well on the right side of that cross section.

A. Okay, this one.

Q. Is it not true that that well was perforated two separate times?

A. I think I stated the last time that it was perforated two separate times. It was perforated three separate times, I found out Sunday night at about 11:00 o'clock.

Q. What was the date of the first perforations?

A. February the 2nd.

Q. You didn't perforate that well on January 30th, 1978?

A. Not to my knowledge.

Q. Okay. What does your information indicate you did on February 2nd, 1978?

A. We ran 2-3/8ths tubing and packer, set packer, and perforated.

Q. Where did you perforate the well, at what depths?

A. 15,127, 28, 29; 12,941, 43, 45, 49, 51, and 53.

Q. Those are perforations in the number four sand stringer that turned out to be very productive in the No. 35 Well, is that not true?

A. There were several -- it is a broad interval. Yes, I think is the answer to that question. I believe they went up that high.

Q. Isn't that zone about the top of the Morrow Clastics; the first Morrow stringer below the top of the Morrow Clastics was perforated, Mr. Bosecker, was that -- was that zone acidized?

A. I have some of the records and I do not -- I think that both zones were, everything was acidized, if the C-105 is correct. Sunday night I couldn't find everything, but the C-105 shows that the interval from 12,761 to 12,941 was given 2500 gallons of 7-1/2 percent NE acid.

Q. Excuse me, and when did that take place?

A. Well, let's see, I'm -- what I was trying to do Sunday night was piece together all this information, and I found some of it.

I think that took place on the 2nd of February, and I told you that it was perforated on the 2nd. I think it was perforated on the 1st now. I was reading the morning report of the 2nd, but that would have been the

day of the first that the work took place.

Q. All right. After the well was perforated and tested at that particular zone, what were the results of the test?

A. It was flowed and swabbed and it was not a great amount of gas, but it did produce gas. It was flowing at 15 Mcf a day, I believe.

Q. Did not that test show that the gas flowed with an 18-inch flare but the volume was too small to measure and that the pressure on the test was 10 psig?

A. The flowing pressure?

Q. Yes.

A. That, I don't know, but that might be possible.

Q. All right. Would that test also show that the well was open to the atmosphere at 4,450 psig and bled down to 10 psig in 10 minutes?

A. Did that test show it?

Q. Yes.

A. No, I don't -- that may be accurate, but I do not know that it is or it is not.

Q. Did you -- did you then recomplete this well above the top of the Morrow Clastics marker?

A. We continued the completion of the well, yes.

Q. All right. The next point at which you perforated the well was above the top of the Morrow Clastics marker. That's true, isn't it?

A. Well, we -- the next stage of perforations were above and below the top of the Morrow Clastics.

Q. All right, let me know where they are.

A. I've got a map here, if you'd like to look at them. I spotted them on this two-well cross section and some place in my information I have the exact perfs, but the top one was above the Morrow Clastics marker at 12,751. Then there was one at 12,750 -- Or 61 and 64. Now this is approximate, because I'm just reading them off this deal I did late at night.

Q. Well, I understand.

A. But that's not the only perfs. We also perforated in a stringer at approximately 13,030 feet, two shots there, also. We perforated at 13,061 feet, and we perforated at 13,190 feet at the same time.

Q. All right, let me -- let's run through that again, Mr. Bosecker.

When they perforate the well, having previously perforated up in this number four sand and not obtaining production, when they re-perforated the second time, don't they start with the lowest perforation first and then start back up the hole?

A. We did not get the amount of production that we wanted out of the first set of perforations, and that was the reason that we perforated the second and the third time.

Q. Okay.

A. But we did get production.

Q. I understand. I want to know at what point you got production.

A. Well, we had production from the first set. The well was not cleaned up, was not producing at a rate that we were satisfied with, to say the least, but there was production from the well, as you mentioned.

Q. Is it your testimony that the first perforations in the number four sand have subsequently cleaned up?

A. Oh, I think they have, definitely.

Q. Okay. And why did you go on and perforate the entire length of all these sand bodies above and below the Morrow Clastics marker? Within, apparently, a day of the first perforations?

A. To get more zones opened up.

Now, in the 35 Well we made, to the best of my knowledge, one run had adequate production initially, so that zone, or other zones, have not been opened up, but they will be. We're now producing at a slightly less than

4-million cubic feet a day and we're on a choke. We don't need any more production out of that well right now.

Q. You mean the No. 35 Well?

A. Right.

Q. Well, that was completed some eight months after the No. 2 Well.

A. Right.

Q. I'm looking to see how you got production out of the No. 2 Well, Mr. Bosecker.

On February 4th, 1978, did you not start with perforations, perforating this well, commencing with a perforation at 13,222 feet? Do you have a perforation on your log at that distance?

A. 13, 000 what?

Q. 322 feet.

A. Oh, yeah, right.

Q. That was the first perforation done on that well.

A. Well, I don't know. I assume they used a select fire gun. I don't know which was first or which was last. I would have perforated it with a select fire gun, but I certainly wasn't on the location and don't complete the wells.

Q. Okay. Do you know whether or not that after that zone or interval was perforated, that it was

then perforated at 13,320 feet?

A. What?

Q. It was first perforated at 13,322 feet and then it was perforated at 13,320 feet.

Does that perforation show on your log?

A. Well, I have one perforation at 13,322 feet.

Q. Okay.

A. Opposite February the 4th.

Q. Do you have one at 13,320 feet?

A. No, I don't.

Q. Do you have one at 13,190 feet?

A. Yes.

Q. And do you have one at 13,061?

A. Yes.

Q. Do you have a perforation at 13,029?

A. 13,029?

Q. Yes.

A. Approximately.

Q. Do you have a perforation at 13,023?

A. 13,023, no, I don't.

Q. Okay.

A. I could have missed one.

Q. What is the top of the Morrow Clastics marker in the No. 2 Well?

A. It's approximately 12,829 feet.

Q. Isn't it true that you did not obtain production from any of the perforated zones below the top of the Morrow Clastics marker and that this well produced only after being perforated at intervals from 12,762 feet to 12,761 feet?

A. I would not say that.

Q. Okay. You agree, do you not, that the No. 2 Well is now producing from a Morrow Sand stringer above the top of the Morrow Clastics marker?

A. Yes, I do.

Q. Is that same sand stringer producing in the No. 35?

A. No, but I do believe that it's capable of producing if we perforated it, and we do plan to perforate it.

Q. Would you go back now to Getty Exhibit Number Seven, which is your cross section that shows the four wells?

A. Yes, I'm there.

Q. Would you look at the Shell well, which is the storage well No. 2, located in Section 34, and tell me which ones of the Morrow Sands stringers present in that log actually produced?

A. Well, I really think that -- that Llano

could tell you the details much better than I can.

I generally looked at their logs.

Q. Mr. Bosecker, you testified that based upon your study and the exhibits we're now talking about, that you reached the conclusion that this was a common Morrow reservoir in which the sands were continuous throughout the reservoir; that it was deltaic in composition; and that the sand bodies were reasonably uniform and productive, and I want to test --

A. That's correct.

Q. -- your knowledge of that.

All right, tell me what --

A. But I do not know exactly where each of Llano's perforations are.

Q. It makes a substantial difference as to the quality of the sand deposition as to whether that sand produced or not, does it not?

A. You mean producing rate is dependent upon sand quality?

Q. No, I don't think that's what I asked you.

A. Okay, well, what did you ask me?

Q. You have contoured what you believe to be at least four Morrow Sands below the top of the Morrow Clastics present in the three wells on this cross section plus the Pogo Well. I want to know now which ones of those

zones have ever produced anything.

A. What I have done is correlate recognizable stringers across the field.

Q. All right.

A. I have not testified that a particular stringer is perforated.

Q. Don't you think it will be critical to a conclusion you've reached that each of these wells will drain 640 acres that you know what zones they produce from and in what quantities?

A. I think that we have cumulative production and enough information available to say that the storage project was -- area was depleted or near depleted at the time that it was initiated, and we -- I can give you the exact perforations on our wells.

Q. Let's go to Getty Exhibit Number Fourteen. All right, if you'll also look at Getty Exhibit Number Thirteen and Getty Exhibit Number Twelve at the same time we look at Getty Exhibit Number Fourteen.

Okay?

A. I'm there.

Q. Now, Getty Exhibit Number Thirteen is the same exhibit, in fact these are Llano's calculations on a material balance for a number of wells that they introduced as Exhibit Number E at the Examiner Hearing. That's what

this Exhibit Number Thirteen is, isn't it?

A. The first four wells are the same.

Q. All right.

A. Exhibit Number Twelve is identical.

Q. All right. Exhibit Number Twelve, then, is -- is the one with Llano's information on it. Exhibit Number Thirteen is the one where you recalculated the original gas in place on the Llano Government A No. 1 Well, located in Section 10.

A. Yes.

Q. All right.

Now in looking at Exhibit Number Fourteen, Mr. Bosecker, I believe it was your testimony under direct examination that but for the existance of the fault lines on east and west, that the storage wells would have drained more acreage than has been attributed to them by Getty Exhibit Number Twelve.

A. I think that's correct.

Q. Have you calculated the total number of acres that Llano says have actually been drained in accordance to the material balance calculation for the storage wells 1, 2, 3, and 4 on Exhibit Number Twelve?

A. You mean the surface acres that are depicted on the map or just --

Q. The calculated drainage area depicted on

Exhibit Number Twelve.

A. I have made several calculations. I do not believe I added up those four wells only.

Q. You would not disagree with me that adding up those wells you'd get 1,298 drained acres?

A. I don't know.

Q. Would you like to double check?

A. I assume that you're correct.

Q. Now, you said in regards to one of the later exhibits that you planimetered the acreage involved in one of your radial drainage circles. Have you planimetered the acreage located in Section 34, 33, 3, and 4, that is contained between two fault lines and the north and south section boundaries of those particular sections? Do you know what that acreage is?

A. I did planimeter it. I do not know the summation of the four.

Q. You would not disagree with me, would you, that that approximates 1,500 acres?

A. 1,500 acres. I assume that to be correct. What was the other number?

Q. 1,298 for actual drained acres.

A. Okay. To the best of my knowledge that is approximately what I -- I had some other numbers included, but that sounds reasonable.

Q. If you'll look at Exhibit Number Twelve and find the storage well No. 2, it shows that it --

A. Exhibit Number Twelve.

Q. Exhibit Number Twelve.

A. Okay.

Q. The acres drained attributed to that well on that exhibit are 470, right?

A. Yes, that's the same as on -- yes.

Q. All right. And it is your testimony that but for the existance of the faults, the one running north and south through Section 34 and the one through Section 33, that you would anticipate that that well would have drained 640 acres.

A. I think the faults are the main controlling factor to a limited drainage.

Q. There is absolutely no control to the drainage to the north of that well, is there?

A. No control.

Q. That's right.

A. What do you mean by control? You mean no other wells drilled up there?

Q. No other wells drilled up there. There is no fault across Section 27 or 28 in a horizontal way that would have precluded that Llano well from draining 640 acres, despite the existance of the fault in Section 34.

A. Well, to the best of my knowledge there isn't, but Exhibit Number Fifteen of Llano's shows a permeability barrier across there.

Q. Now, in looking at Exhibit Number -- Number Thirteen -- well, let's go back. Let me ask you another question.

Do you see -- do you see a permeability barrier that would have precluded the well, the storage well No. 4 from draining more than 285 acres?

A. The rock properties in that particular well are not as good as in other wells, and I think you can see that from its cumulative production. In fact, that well's rock properties are pretty low and --

Q. Well, I thought -- excuse me, I didn't mean to interrupt you. I thought you told me the rock properties for all these Morrow wells were similar and that's one of the reasons you reached the conclusion that this was a deltaic deposition.

A. The rock properties in the area of Well No. 4 are good. I'm just stating they're not as good as some of the other wells. If you remember, Shell presented testimony that from the No. 1 Well to the No. 4 Well it only took ten hours to get pressure response, so that indicates in even the No. 4 Well that shows on here to have 7.1 percent porosity, it's not as good rock properties, but

yet it's good enough to have that distance, which is well over 640 acres areally in a drainage radius.

Q. Now that Shell test, the interference test between the wells in Sections 4 and 3, was run back in 1962, some fourteen years ago, '65, I'm sorry, '65.

A. It was presented in November of 1965.

Q. All right, so it's more than fourteen years old.

A. Yes, but the rock properties at the bottom of the hole haven't changed much.

Q. But the performance of the particular wells have, haven't they?

A. Well, when pressure is reduced, performance changes, sure.

Q. In fact the pressure has been reduced in all four storage wells. They're totally depleted, aren't they?

A. That was the statement of record.

Q. You don't disagree with that statement of record, do you?

A. I don't think that it's material for me to comment on it, really.

Q. All right. When did primary production stop on the four storage wells? Give me an approximate date.

A. Probably can do a little better than that. In '73 the storage project was initiated in the No. 1 and No. 2 Wells.

Now I have the exact dates production was stopped on each of them that I can look up, I think, if you want it.

Q. I'm interested in your Exhibit Number Thirteen and your calculations of original gas in place on the Llano Government A No. 1 Well.

After 1973 Llano started putting gas back in the ground in this formation as storage wells, didn't it?

A. Yes.

Q. Don't you think that will have some material effect on the original gas in place that you now attribute to the Llano A No. 1 Well?

A. That's a possibility, a very intriguing possibility.

Q. In fact, the Llano Government A No. 1 Well is being recharged by the storage wells, aren't they?

A. I don't know. There is some testimony in the record stating that the Government A No. 1 Well was completed in a zone that was separate to most of the other wells, and I cannot say that there is communication across there.

Q. All right, let's look back at Exhibit Number Twelve. What is the original gas in place that Llano has attributed to that particular well?

A. 1-1/2-billion.

Q. Say again.

A. 1-1/2-billion.

Q. All right. Now, let's go over and compare the original gas in place --

A. Well, excuse me, that was primary. The original gas in place on Exhibit Number Twelve was 1.918750.

Q. All right, and your opinion is that the original gas in place was 3. -- almost 3.5-million.

A. That's my estimate.

Q. Where did the original gas come from if it did not come from recharging the storage wells?

A. From the Morrow zone.

Q. You agree with me it's equally logical that the difference in the original gas in place you now attribute to the Llano Government A Well could have come from the storage wells.

A. Not if it's completed in a separate interval, no.

Q. Do we have a cross section of the logs of the Llano Government A Well with the storage wells? Have you introduced that?

A. No, I do not have one.

Q. So if you believe that to be true, you would have introduced an exhibit demonstrating that for us, if those produced out of different Morrow Sands.

A. No, not necessarily. I did not even consider making a cross section north/south across the storage project.

MR. RAMEY: Mr. Kellahin, are you at a convenient stopping place?

MR. KELLAHIN: Yes, sir.

MR. RAMEY: All right, let's recess until about 1:15.

(Thereupon the noon recess was taken.)

MR. RAMEY: The hearing will come to order. Mr. Kellahin.

MR. KELLAHIN: Yes, Mr. Ramey.

Q. (Mr. Kellahin continuing.) Mr. Bosecker, I believe in response to a question that Mr. Carr asked you that you responded that Llano had reserves that they have not produced in the east half of Section 34 and in Section 3. Do you remember that testimony?

A. Yes.

Q. Would you look at your Exhibit Number Thirty-one, please?

A. I have it.

Q. Now, if I understand this exhibit, the red circle indicates a drainage radius, the circular pattern on 1,650 feet.

A. That is correct, which is the minimum distance from the outer boundary that exists now under the existing rules.

Q. And I believe you testified at some point this morning that the drainage radius for a 640-acre area would be some 2980 feet?

A. Approximately.

Q. That's about it, huh?

A. I can find out exactly.

Q. That's all right, that's close enough, 2980.

A. 2978.

Q. Now it was also your testimony that in your opinion the well in Section 35, the Getty Well in Section 35, was draining 640 acres. Did you reach that conclusion? Or did you not?

A. I never testified to that fact, but I will. I think that on the ultimate life of that well that it can effectively drain 640 acres.

Q. All right. If you assume that and you take a drainage radius of 2,970 feet around the Getty well in Section 35, that well will drain a substantial portion of the east half of Section 34, is that not true?

A. That is true.

Q. I'd like to refer you to your data sheet on Horner plot, I think it is Exhibit Number Twenty. It's for your Getty Two State Well.

A. Yes.

Q. That is the data sheet for the February '78 test on the Getty Two State Well. Would you pull out your Exhibit Number Twenty-two, which is the December, '78 test on the same well?

A. Yes.

Q. Now in connection with those two exhibits let's pull out one of the material balance calculations. Let's look at, well, Getty Exhibit Number Twelve, I think will show it.

A. Okay.

Q. On Exhibits Twenty and Twenty-two you show a summary of the kh calculations and in that summary you indicate a k based on 33 net feet pay in both of those exhibits for the Getty Two State No. 1 Well. That's true, isn't it?

A. That's true.

Q. Have you made a calculation based upon that thickness of net pay for that particular well to show what the material balance calculation would demonstrate for a calculated drainage area for the Getty Two State No. 1 Well?

A. No, I have not.

Q. Would you agree that such a calculation could be made from the data contained on Getty Exhibit Number Twelve and simply substitute in the net feet pay factor that you have on your data sheet?

A. No, I would not agree, because one of the things you need is the primary gas production.

Q. What is the primary gas production you attribute to the Getty Two State Well?

A. Well, we haven't -- these four wells plus the Government A No. 1 Well has -- they have been -- the four wells have been depleted, and so the original gas in place number has a high degree of certainty to be correct, and for that reason I did not do -- make calculations for the Getty Two State or even for the Getty 35 State. If you remember I, in my next exhibit on drainage area, I even excluded the Getty 35 State because that --

Q. Come again.

A. Because that gas has not been produced and there's no way that you can say for sure everyone of

these slots in here.

Q. Well, I'm having trouble understanding that, Mr. Bosecker. You're willing to rely upon Llano's calculations of material balance, using the original gas in place numbers to conclude from your testimony that they were draining 640 acres, yet you're not willing to use the same calculations to determine the drainage pattern for either one of your wells.

How can we have it both ways?

A. All I'm saying is Llano used this exhibit. They knew what the gas in place was because they had already captured that gas.

The Getty 35 State No. 1, the Getty Two State, in not depleted at this point in time, so it's apples and oranges, as far as I'm concerned.

In fact, the Llano Government A No. 1 is still producing and that one is not, you know, we had to estimate what the remaining reserves were on that one, but there is a lot of information available on the Llano Government A No. 1 and it can be done with a reasonable amount of certainty because it's produced for several years.

The Getty 35 State No. 1 and the Getty Two State No. 1 have just been completed in the last 24 months. ON the east side of the fault you do not have the knowledge accumulated at this point in time that you

do on the west side of the fault.

Q. Are you telling me that Getty would not recommend making a material balance calculation based upon the present knowledge of the production from either the Getty 35 State or the Getty Two State Well?

A. I am not saying anything in that direction. What I'm saying is that was the reason we did not do it. We wanted to make it as factual as possible.

Q. Isn't it a common industry tool in the oil and gas industry to make material balance calculations based upon the production history of a well that has not yet been fully depleted?

A. Do you have reference to volumetric calculations, reserve calculations?

My answer is yes.

Q. Have you made such a calculation on the Getty 35 State No. 1 Well?

A. We have in-house reserves on every well we drill and produce, yes, sir.

Q. All right, what is the original gas in place attributed to the Getty 35 State?

A. I think I have a note here available. I'll have to check.

11.3 billion cubic feet. Now, I want to elaborate that we use volumetric calculations for initial

estimates but in no way do they have the accuracy that production performance curves,bottom hole pressures, and other tools have.

Q. What is the original gas in place you attribute to the Getty Two State Well?

A. This estimate that was made shows 7.760 billion.

Q. Would you agree with me, Mr. Bosecker, that if used 32 -- 33 feet of net pay that you've evidenced on your data sheet for the Getty No. 2 State Well, and then if I attribute 7-million cubic feet of gas in place, and then if I go through the material balance calculations on Exhibit Number Twelve, that will show an acreage drainage area of something over 200 acres?

A. Well, I haven't done it.

Q. You wouldn't disagree that that is pretty close to being true.

A. I don't know.

Q. But you've not done those material balance calculations on either one of these two wells.

A. We have calculated some tentative volumetric reserves. We haven't gone through this procedure because it is not relevant.

Q. All right. Based upon your experience in the Morrow area, Mr. Bosecker, can you estimate for us

the volume of original Morrow gas in place necessary to deplete a reservoir of 640 acres?

A. What?

Q. What is the volume of gas in place necessary in the kind of reservoir you've encountered here in order to drain an area of 640 acres?

A. Well, now, the amount of gas in place is dependent upon a whole lot of different things. For one thing, is how far down you take it as far as the economic limit. The calculations that I just quoted you on the volumetric reserves I believe we used a cutoff of 2000 pounds, and it's quite possible that this will be taken down much further than that.

But porosity is important. The thickness is important. There's many, many factors involved.

Q. Getty Exhibit Number Twelve demonstrates those factors on at least six Morrow wells, doesn't it?

A. Getty Exhibit Number Twelve, which was the Llano Exhibit E, exhibits on four wells that it's known. On the Government A No. 1 there was an estimate made, which we disagree somewhat as far as the primary gas production. The Getty 35 State No. 1, Llano used their expertise, I believe they said, in having a hundred wells connected, to estimate that this particular well would only produce 5-billion cubic feet, and then they went on down and showed

that it could only drain 262 acres.

So if a well has 11.3 billion cubic feet, you can see that would increase substantially the drainage area.

Now also that was 11.3 billion cubic feet of producible reserves above the bottom hole pressure of 2000 pounds. That did not include any primary oil production. It did not include the recovery factor. In other words, it was 11.3 is not the original gas in place. That was the ultimate producible reserves down to a 2000 pound bottom hole pressure.

Q. In your testimony with regards to the unorthodox location, you indicated that this was a non-prorated Morrow gas pool, and that you recommended some type of penalty factor based upon a deliverability test. I believe that's what you said.

A. Yes, that's what I said.

Q. Are you familiar with the Commission's order, I believe there's only one or two, that have been entered that establish a penalty factor in a non-prorated gas pool with regards to acreage location?

A. The Yates well?

Q. Yes.

A. You have reference to?

Q. You're familiar with that order?

A. I have read it.

Q. All right. You're also aware, are you not, that the Examiner order entered in Llano's case from the March, '79 hearing, did not apply any kind of penalty factor to the Llano well whatsoever. You're aware of that, are you not?

A. I wouldn't say that. Let me read what I think is -- excuse me, I have to get something else.

Okay. It says that insomuch as the east half of Section 34 does not meet the acreage dedication requirements for the lands for which the limited, temporary 640-acre spacing was established by Order Number 5995, said east half of Section 34 constitutes a 320-acre non-standard proration unit for these lands; that insomuch as it is impossible to dedicate a standard 640-acre unit to said well, the applicant should file an application for hearing to consider a non-standard gas proration unit for the well, and such unit would logically be either a 320-acre non-standard unit, comprising the east half of Section 34, and be subject to a production limitation factor due to the deficient acreage dedication, or a 640-acre non-standard unit comprised of the east half of Section 34 and the east half of Section 3, Township 2 South, Range 34 East.

Q. So the key to the entire discussion is whether or not the wells east of the fault line are spaced

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on 640 acres or spaced on 320 acres.

Once that decision is made then you can logically either apply or not apply a penalty factor. Is that not true?

A. Well, that's the primary thing, is the 640-acre spacing.

Q. All right. Now with regards to a penalty factor in a non-prorated gas pool, you're aware, are you not, that the Division sets a minimum allowable for any penalized well?

A. I have heard of that, yes.

Q. Would you not agree that a minimum daily allowable of 2000 Mcf per day would be a reasonable minimum below which a penalty factor should not be assessed? 2000?

A. In my personal opinion that sounds high.

Q. Would you think a penalty factor with a minimum allowable below which the penalty does not apply of 1500 Mcf per day would be a reasonable figure?

A. You're getting closer.

Q. All right. Would you pull out Getty Exhibits Twenty-five and Twenty-eight?

Would you look at Exhibit Number Twenty-five, that's your production tabulation on the Getty No. Two State Well.

A. I have it.

Q. Was the line pressure during the entire period of production for this well constant?

You do not know?

A. No, I understand it averages between 350 and 500 pounds, but other people here can tell you.

Q. Is that well equipped with a choke that can be adjusted to fluctuate the rate of production on that well?

A. That is right.

Q. Has that choke setting remained constant for all the months of production? For this well?

A. I really can't say. I know one time we increased it to a rate of approximately 2-million a day, and we started making a little sand and so we reduced it back to 1.7-million a day.

Q. What accounts for the dip in production in September? '78?

A. I have no idea. Mr. Klaar testified that there was some mechanical problems for this well as far as the pipeline, but he didn't elaborate when, and I am not involved in the day-to-day operation in the area office.

Q. What was the original bottom hole pressure when the Getty Two Well was completed? I think you gave that to us before. What was it?

A. Well, let's see. It's on Llano Exhibit -- 8224, on 2-14-78. It's on the old Llano Exhibit E.

Q. And if you'll look at Exhibit Twenty-Eight that's a tabulation of production on the Getty 35 State Well. What was the original bottom hole pressure on that well?

A. Okay, I have it here. 7468.2 absolute.

Q. That's January 13, 1979.

A. That sounds about right. I think the test date was January 23rd, '79.

Q. Now on the Getty 35 State Well, have you fluctuated the choke on that well to maintain production at a certain volume?

A. Well, I know -- I don't know that the choke has been changed but I do know we could increase production substantially by opening the choke up. It's flowing at a restriction of 4400 psi.

Q. To the best of your knowledge the choke on that well has not been fluctuated during the production you've indicated on your Exhibit Number Twenty-eight?

A. We elected to produce the well at 4-million a day or less at the time. I had it, do not know that that is going to take place in the future, but that -- we decided to keep it at that, right, and I don't know the exact choke size, other than on the current choke is 12/64ths. Now if

we're opening it up, we haven't opened it up very much, because that's a pretty small choke on the well.

And the choke on the other well, the Getty Two State, is 7/64ths, even smaller.

Q. Doesn't your Exhibit Number Twenty-eight demonstrate that between March and April there's been a decline of 10,000 Mcf in the production of the well and would you not attribute that to a decline in the capacity of this well to produce from the Morrow formation?

A. What well are you talking about?

Q. 35. Exhibit Twenty-eight.

A. I have not seen any indication whatsoever that that well is declining in production. I feel confident that we could produce and we may elect to try to produce 6 or 7 million a day in the near future.

Q. Mr. Bosecker, was it not your testimony before the Examiner on March 14th, 1979, that you believed the 35 Well and the Getty No. 2 Well were in pressure communication with each other?

A. Yes, I did say that.

Q. And then you have not come forward today with that type of testimony, have you?

A. I don't think that I have said that today, no. I think that the reservoir characteristics are such, the kh in both of the wells, in 35 it's 160, appro-

ximately, that's just approximate; and the other well is 60-something, that those characteristics are such, and knowing to the best of our knowledge there's no fault in between, being able to correlate the sands, that there is or there will be pressure communication between those two wells.

Q. But in reaching that conclusion today you've excluded testimony that you introduced in March of '79 indicating that comparison of the original bottom hole pressures in the well and the subsequent production, that you reached the conclusion that there was pressure communication between the two wells.

A. I have not said that today, no.

Q. In fact, the reason you've said it -- not said it today is the fact that you no longer believe that to be true.

A. I do not believe that we can clearly show that. As I said, with the kh, there is no question in my mind that the rock properties are such that there will be communication through the reservoir.

Q. Does the fact that the No. 2 Well is producing above the top of the Morrow Clastics and the fact that the 35 Well is producing below the top of the Morrow Clastics influence that decision?

A. The decision that there is --

Q. No communication between the two wells?

A. I have not said there is no communication between the two wells.

Q. Now, let's look at your Horner plots. Did you actually prepare these Horner plots?

A. Members of my staff prepared them. I have looked at them and can -- in fact, we have done them twice. I asked that they be double-checked.

Q. These are the same Horner plots that were introduced at the March, '79, Examiner Hearing, in the Llano case?

A. Yes.

Q. All right. You've not changed any of the data or the information contained on the Horner plots since that hearing.

A. Yes, we have.

Q. You have?

A. Uh-huh.

Q. Tell me what information has been changed.

A. Mr. Nutter pointed out that our delta T wasn't correct, so we had the bottom typed, just -- it now reads T plus delta-T over delta-T.

Q. All right.

A. There's been that kind of correction on one or two of them.

Q. What are the assumptions inherent in a Horner plot, Mr. Bosecker?

A. I really don't -- can you get more specific in the question?

Q. Doesn't the Horner calculation in plots assume that this is a homogenous reservoir of uniform thickness?

A. No.

Q. All right. In what types of reservoir do you use a Horner plot?

A. Getty uses Horner plots in all reservoirs that we can, particularly in gas wells, because it gives us an idea of skin damage, initial reservoir pressure, layering, many, many different reservoir -- permeability.

Q. Is the Horner plot specifically designed for a heterogenous reservoir?

A. No.

Q. Is it specifically designed for a homogenous reservoir?

A. No.

Q. Is it your opinion that you can use the Horner method satisfactorily regardless of the type of reservoir?

A. That's a big question.

Q. Well, you've just told me that you use it

without discrimination regardless of the kind of reservoir.

A. We use it on all kinds of reservoirs. Now, I can imagine many things, such as a permeability pinchout, plus a fault in another direction, plus a change in thickness in another, plus a boundary, say, on oil/gas contact, where -- where you could not interpret it accurately because there's too many things going on at the same time.

Q. What is the average permeability you've encountered in this particular area?

A. Well, we have not had cores. We've had to rely upon the Horner plots to obtain the permeabilities that we do have.

Q. And what generally is that average?

A. Okay, in the Getty Two State at one time, the first time it was measured 2.0 millidarcy; the second time 2.2 millidarcys.

Now in the Getty 35, which is a better well, no question about that, I don't think, 5.5 millidarcys. But --

Q. The higher the millidarcy, the greater the permeability.

A. Millidarcy is a measurement of permeability, yes. It's a unit of measurement.

Q. The higher the permeability, the less area it takes to contain a gas reservoir than at a lower

permeability.

A. I don't think you know what you're saying. Reword that.

Q. All right. How about the higher the porosity, the smaller number of acres would be necessary to contain that quantity of gas?

A. You mean -- you say a given quantity of gas, like 1-billion cubic feet.

Q. Uh-huh.

A. Okay. The higher the porosity, the smaller the affected drainage area would be for that volume of gas.

Likewise, if you have a thick net pay, like in one of the Llano exhibits, 15 feet.

Q. Uh-huh.

A. The drainage area is relatively small but if you increase it, like back when it was shown in '73, down to 8.3 feet, that pancakes it out and makes it go further out.

Q. Okay. What was the porosity cutoff used in the Isopach put together back in '72, which you introduced as an exhibit?

A. I introduced that as an exhibit as a matter of record. I did not prepare it. Llano testified to its accuracy.

Q. Wouldn't the porosity cutoff factor have

a material effect upon the material balance calculations that you made based upon that Isopach? And its comparison to the material balance calculations that were introduced at the hearing in March of '79?

A. To simplify everything, I used the exact same porosities, the only porosities that were a matter of record, which were testified in March, '79, for every well.

Q. But you don't know if the porosity cut-off for the exhibit prepared in '79 was the same porosity cutoff used for the preparation of the Isopach in '72.

A. That's a fair statement.

Q. If the porosity cutoff was 6 percent in one and 5 percent in the other, it would make a substantial difference in your calculation, would it not?

A. Yes, but it would not of --

Q. It could affect the area drained by as much as 25 percent in the calculation.

A. What were the numbers?

Q. The porosity cutoff difference of 6 percent versus 5 percent.

A. It could. I doubt seriously that it would.

Q. Would you generally characterize this Morrow formation here as a tight reservoir of low permeability?

A. It depends upon what you're comparing it

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to. If you're comparing it to the Gulf Coast, yes.

Q. All right. If we had a permeability reading of 2 millidarcys, that's a pretty tight reservoir, isn't it?

A. Out here it's a pretty good reservoir. In fact, I don't want to get in this good and exceptional, but --

Q. Well, I don't want to either, because I don't think it's relevant.

A. I don't either.

Q. I want you to tell me, though, what you find to be the average permeability across this reservoir, and whether that permeability is constant among all the Morrow wells.

A. I have very limited information as far as permeability measurements. The only measurement that we have done is with the Horner plot. We have attempted to cut cores and have been unsuccessful due to drilling problems.

There have been some cores that have been cut, and they're on the storage wells and the Government A No. 1, I believe, was cored, but I do not have that information.

Q. On your Horner plot, how long did you shut the well in to stabilize it before you started running

your plot?

A. Which Horner plot?

Q. Pick any one you like. How many Horner plots did you run?

A. We've run three.

Q. You've got two on the No. Two State and we've got one on the No. 35 State.

A. And your question?

Q. How long --

A. How long we shut it in before we ran it? Is that what it was?

Q. That's right. How long did you shut the well in in order to stabilize the pressure before you started to run the test?

A. Well, the Horner plot is run with the well flowing and then it's shutin and the shutin portion is the Horner plot, so we did not shut the well in at all before we initiated the Horner plot.

Q. All right. Before each test, then, how long did you flow the well before you shut it in to take the test?

A. I can just give you an estimate.

Q. All right.

A. On the Getty Two State it appears that it was shutin on February the 14th. The well, I believe,

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was turned on and a 4-point was run on February the 13th, which was the official potential test.

After that was over we ran a bomb to the bottom on the 14th. These are approximate dates, but to the best of my knowledge. Shut it in and ran this Horner plot. Ran the pressure buildup, rather, excuse me.

Q. On the Horner plot for the Getty Two State that was conducted in December of '78, how long did you run that pressure buildup test?

A. The well had been producing for several months and the exact time of the -- or the exact length of time of the shutin I do not know, but I would guess from one to three days.

As you can see we're on the straight line portion, so we ran it long enough to get -- to get an accurate test.

Q. Was the pressure buildup test in each of the three tests run somewhere between 24 and 72 hours?

A. I would think so, but I can't say for sure. I just don't have that information here. With the kind of permeability that we knew we had, it would -- I know that we wouldn't have normally left a bomb on bottom over three days.

There are wells that we leave bombs in for fifteen days, then continue to leave the well shutin,

and come back another fifteen days. In one we ran it after 46 days and it was still building.

But unfortunately that wasn't this area. But that shows you the difference between wells.

Q. Do you agree in running a Horner plot that it's better to have a pressure drawdown test than a pressure buildup test?

A. No, not necessarily. You know, some people run one kind of open hole log and some run another, and this is a very satisfactory means that Getty uses to evaluate the wells that it drills.

Q. Does not the Horner plot become more accurate the longer you run either the pressure buildup test or the pressure drawdown test?

A. What you have to do is get on the straight line portion of the curve and once you're on that you're okay. You can draw a straight line to infinite shutin time.

The only problem that you could have would be that if there are -- it's possible that the slope could change, but in these cases we're clearly on the straight line portion of the curve.

Q. Back earlier in February of '78 on this Getty Two State Well, if you'll look at your Exhibit Number Nineteen, that was the first Horner plot run on that well.

A. Yes.

Q. The Horner plot indicates that the points have not stabilized until some time later in the test and that the first portion of that test shows a curve in the points plotted. Can you attribute that type of plot on this Horner curve as evidence of damage to this formation?

A. Which points? Would you count the points and tell me what you have reference to?

Q. Well, you'll have to tell me because I believe it was your testimony that you felt that the Horner plot would give you evidence of a layering effect between the two producing formations.

A. Oh, it does, as far as I'm concerned.

Q. All right, show me where you see that.

A. Okay. Layering can be seen as a result of the two parallel lines that are drawn, and --

Q. Depending upon where you cut off the two lines you would see a similar type curve if this was indication of damage in the reservoir, would it not?

A. I don't think so. Now, layering from multiple zones can be depicted by parallel lines. Skin damage, which you have reference to, looks differently and I have some exhibits here, if you would like to look at them.

Q. I'd like to look at that Xerox out of

your manual indicating the types of theoretical curves you would see, and compare them between skin damage and the layering effect you think this indicates.

A. Okay. Okay. If I can find it.

Shall we introduce these as --

MR. CARR: I think so. This will be Getty Exhibit 33.

Q. Mr. Bosecker, I believe everybody has before them a copy of Getty Exhibit Number Thirty-two, and would you identify to us the two curves that are indicated, the first one, which would be evidence of skinned or a damaged zone, where is that?

A. Okay, that's the top middle one and you can extrapolate that straight line portion on out to infinite time on the righthand side. And the damaged zone can be depicted by where the points initially are below that.

Q. Where is the two layering effect sample?

A. Okay. That is in the middle of the third one down, and again you can extrapolate -- this is not the best exhibit in the world -- but a straight line on over to infinite time on the righthand side. So you end up with two parallel lines.

Q. All right, looking at the sample in the center bottom row that's the layering effect, if you extrapolate out your points on the top line, the one that curves,

from left to right, and extrapolate that on, it will look very much like the curve for the damaged zone, won't it?

A. In the middle top if you extrapolate backwards, like I said, it will look like it is the damaged zone.

Q. Now, if you're simply producing from two different layers within the same Morrow Sand stringer, you might also see this same type of effect.

A. That is possible but I'd like to qualify that. When -- when this happens you're usually talking about a thick zone, you know, like 100 feet, and you have two distinct zones with two different kh's, and in fact I can show you some examples of that, but every zone has variations; each quarter of an inch changes, and included in the one member you have a whole bunch of little changes and they do not act like a stairstep going up with all these different parallel lines.

Q. Would you look at Getty Exhibit Number Twenty-seven? This is your production curve on the Getty Two State Well, right? Exhibit Twenty-seven?

A. This is one of them, yeah.

Q. All right. I missed the significance of this exhibit, Mr. Bosecker. You made reference to the gas produced and the condensate produced, and I'm sorry, but I didn't hear what this meant.

A. Well, I stated that initially the well produced condensate three, then the condensate started increasing and leveled off as it is now, and I have -- to me it is an indication that the second zone is coming in.

I am also aware that there are some production problems that were associated with the well, and I've tried to pinpoint how much production problems there are, whether or not they were enough to affect this curve materially or not. This is -- and I do not believe so, but I cannot state one way or the other.

This -- what we'd plotted this from was our records in-house, showing the production that was produced and measured on a daily basis or near daily basis. It was not on a daily basis, spot production.

Q. This -- this is the Getty Two State Well that was tested below the top of the Morrow Clastics and then later perforated above the top of the Morrow Clastics. That's the well we're talking about?

A. Yes.

Q. All right. Now, are you telling me that the condensate production here that picked up in July is what you believe to be that lower zone now cleaning out and contributing to the production of the well?

A. Since the other well is only perforated below the Morrow Clastics, and since it produces condensate

similar to this condensate, that is what I think it means.

Q. Okay.

A. But like I said, during this time there was mechanical problems and Llano had problems, Getty had problems, and I think that it reflects this.

Q. You think that despite the production problems, the curve indicates that this other Morrow zone present in the Getty Two State Well is now producing?

A. Oh, I am confident that the Morrow is producing, yes.

Q. And you have --

A. I think that the Morrow is above and below the Morrow Clastic interval as far as Getty is concerned, and that is the section that we want the field rules on.

Q. And you're satisfied that you've had an opportunity to explain that production problems don't really cause a curve to do this kind of thing.

A. No, I said I, to the best of my knowledge, I do -- I really can't say for sure if they do or if they don't, other than the field has told us that as the other zone cleaned up we increased our condensate. All I did was plot the condensate and the gas produced. I do know that Llano had some problems with dehydration out there.

Q. But then you reached the conclusion that

you, based upon your study, that that was this other Morrow zone coming in on the Getty Two State Well.

A. I introduced it as an exhibit and I assumed that if Llano would take exception to it, they will. To the best of my knowledge it indicates, it's just an indicator, of -- of the facts.

Q. That's one of the factors you've used in reaching your conclusion that these wells will drain 640 acres, isn't it?

A. This testimony is that, yes.

Q. All right. Would you be surprised to know that in July when the condensate production began to increase that it was only at that time a separator was set on this well, and that prior to that time the condensate production had been going into the gas sales line and being recovered at the sales meter?

A. I am not aware of any time that a separator was set. I do know there was some problems as far as dehydration. I was told that.

Q. Do you know if there is a separator on this well now?

A. No.

Q. Okay, so you --

A. But I assume that there is.

Q. Okay.

A. I have not ever been on the location myself.

Q. Okay. What was the cost of the Number Two State Well?

A. Approximately $2.1 million.

Q. And the cost on the 35 Well?

A. Excuse me. Two State was approximately $1-million. 35 State was approximately $2.1 million, and I do not --

Q. Now is that the total cost of the well or is that Getty's cost? Remember we have some working interest owners in each of those --

A. No, that's gross cost.

Q. All right, so for the Number Two Well we've got a million dollars gross cost and for the 35 well I've got something around $2-million gross cost.

A. Yes, and the reason for the increase was because of the discovery of another zone, which complicated the whole well and it had to be dualled and it's producing almost 400 barrels of oil a day and a half a million cubic feet of gas a day out of the Bone Springs.

Q. I believe you showed me a gas in place figure for the 35 Well of something, 11.1 billion, I believe it was? Are those not the figures?

A. Well, I stated a figure that we -- in-house

figure that we have used, or calculated, was 11.3. Now, this was volumetric and it was down to 2000 pound.

Q. Based upon those kind of reserves attributable to this well and the cost of the well, the Number 35 Well, this well is going to pay out, isn't it?

A. Sure.

Q. It's going to be paid -- it will pay out based upon 640-acre spacing.

A. Yes.

Q. All right. What is the value of the reserves attributable to the well so you can reach the conclusion that the well will pay out?

A. Well, I can state that the well will pay out. Now when you're talking about escalation tables as far as product price and as far as operating cost, and discounting it at your accepted discount rate, I do not know the value of the reserves. That could be done a million different ways and the Federal government will be involved in it several times, also.

Q. Well, if you assume the value of the reserves to be $2.00 an Mcf t' .. would not be an unreasonable assumption for a price, would it?

A. Not for an undiscounted price.

Q. All right. That would -- that would make the total value of the reserves somewhere in the area of

$20 million, wouldn't it?

A. Undiscounted, before royalty to the State, not counting operating costs or initial capital investment.

Q. Subject to those reservations, based upon 640 acres, and the cost of a $2-million well, it will pay for itself more than ten times -- more than ten times.

A. Well, if you had those reservations in, it wouldn't be ten times. It would be more like seven times, maybe, or six.

Q. It will pay out in six or seven times with the qualifications that you've put in there.

A. Well, this is just general numbers undiscounted, and that will affect it also.

Q. And if the spacing is reduced to 320 acres it will still pay for itself more than three times, won't it?

A. If it would pay for itself six times and if it was reduced to 320, I do not think it would pay for itself -- or on 640, if it was six times, I don't think it would be quite three times on 320, because you have to add another well cost in there, double operating costs, et cetera.

Q. Have you made a calculation of what the value of that penalty factor to your non-consenting owners in terms of dollars?

MR. CARR: I'd like to object at this time. I fail to see any relevance spending our afternoon discussing finances of whether and how the well is going to pay out. I don't see how that is really relevant to any of the questions posed to this Commission; I believe a case on a pool should be governed by questions of what one well can effectively drain or whether or not a well is crowding an offsetting property, or whether or not a well has a standard proration unit to dedicate to it, and I'm finding Mr. Kellahin fascinating, but I just don't see the relevance of spending the afternoon batting the costs around.

MR. KELLAHIN: If I may, please, Mr. Ramey.

MR. RAMEY: Mr. Kellahin.

MR. KELLAHIN: The relevance hurts Getty very badly, and is very relevant. It demonstrates one of the very basic principles that we here in unorthodox location cases and pooling cases and spacing cases time after time.

The operator will come in here and say based upon economics it is inefficient and uneconomic for me to drill a well on less than 640-acre spacing. That's been cried in the Morrow for years.

We are demonstrating, I think, very graphically that a well in this particular area should not be spaced on 640 acres for economics. We've seen from his

testimony that a well is going to pay out almost three times according to his reservations, based upon 320 acres. I think that's relevant and critical to the decision that the Commission makes.

MR. CARR: I don't really see how, in response to Mr. Kellahin's statement, how anything is important to this Commission other than the simple fact that it costs twice as much, probably, to drill two wells as it does to drill one; that it advances the time that you hit your economic limit on a well.

I don't see how whether or not there's a penalty factor and how many cubic feet and what you're going to get and let's suppose you get a better price, and when does the Federal government come in, have any bearing on anything before this Commission.

MR. RAMEY: Well, I'm going to sustain the objection, Mr. Kellahin. The witness did not testify to anything on economics. You're bringing this out and I think the Commission has -- has the picture. So I would suggest that you try to confine your questions.

Q. (Mr. Kellahin continuing.) Now, if you'll look at Getty Exhibit Number Twelve, --

A. What is Number Twelve? I just don't have it.

MR. NUTTER: Twelve is the old Llano Ex-

hibit E. That's the --

A. Thank you, I found it.

MR. NUTTER: -- drainage area.

Q. In the center of the exhibit it indicates a thickness of net productive sands and then for each of the six wells tabulated it shows a net productive sand attributable to each of those wells.

Mr. Bosecker, have you independently made your own picks from the logs as to the productive sand intervals for each of those wells?

A. We have looked at the logs and particularly like on the Getty 35 No. 1.

Q. Except to the 35 No. 1 Well, which we'll come back to in a minute, you don't have any disagreement about the net productive sands picked on Exhibit Number Twelve, do you?

A. From what I've seen from the logs these net thicknesses appear to be -- to be reasonable.

Q. Would you look at Getty Exhibit Number Sixteen now, please?

A. I have it.

Q. This is a material balance calculation that you've compiled based upon the old 1972 Isopach that was put together. That's what this plat is, isn't it?

A. That is correct. These footages were

taken from the testimony presented by Llano.

Q. You would agree with me then that we could discard that exhibit and the thicknesses of net productive sand that were picked at that particular time, would you not?

A. I included Exhibit Number Thirteen as a statement -- it's a statement of record, in the public records, and I built Exhibit Number Sixteen based upon this Isopach map to show how differences in the thickness in this particular area can affect the drainage.

Q. I understand what they do, Mr. Bosecker, and you have just agreed with me that Exhibit Number Thirteen would be the net productive sands that you would pick and that the thickness attributed on Exhibit Number Thirteen is the correct one to use.

A. I do not have all the information available that Llano has, like core analysis and, particularly core analysis, which I am sure that are very important, and with the information that I had available, which are logs and it's highly interpretive, I think that the Exhibit, or the other net footages is as accurate as I can define with the tools that I have, but there are other tools available, namely the core analysis that Shell cut that I assume that Llano has.

Q. You're speaking in reference to Exhibit

Number Thirteen, aren't you?

A. I'm speaking with reference to Exhibit Number Fifteen, the Isopach map.

Well, I don't know, I may have misunderstood you.

Would you state it again, please?

Q. Yes, sir. Before we discussed Exhibit Number Sixteen, Mr. Bosecker, I asked you to look at Getty Exhibit Number Thirteen. It was identified to you as being the material balance calculation done by Llano. I asked you to look at the thickness of net productive sand for the wells indicated on that exhibit -- I'm sorry, it was Exhibit Number Twelve. To look at the thickness of net productive sands for that -- those calculations, and with the exclusion of the Getty 35 State No. 1 Well, whether you had any disagreement at all with the thicknesses attributed to each of the wells.

Your answer to me was that you had no disagreement.

I then asked you to look at Getty Exhibit Number Sixteen and we discussed the old Isopach map that was produced back in '72 that showed substantially less net thickness of productive sands in some of those wells.

That was your testimony, was it not?

A. Yes.

Q. All right, sir. Now let's look at Exhibit Number Thirty-five. Apparently you do have some disagreement as to the thickness of productive sands --

MR. CARR: There is no Exhibit Thirty-five.

Q. I'm sorry, Exhibit Number Twelve, Well No. 35.

A. Okay.

Q. If you'll look at the last well, that is the Getty 35 State No. 1 Well, --

A. On Exhibit Number Twelve.

Q. Yes, sir.

A. Yes.

Q. All right. The thickness of net productive sands in that well on this exhibit is 23 feet.

A. That is correct.

Q. Now, if you will look at Getty Exhibit Number Twenty-four.

A. Yes, I have it.

Q. All right. On Getty Exhibit Number Twelve, calculations made by Llano, the Getty 35 State No. 1 Well is attributed a thickness of 23 feet, and if you'll look on your Getty Exhibit Number Twenty-four, you attribute 32 feet of productive sand to that well. Is that true?

A. That's -- yes.

Q. All right. If we take the same calcula-

tions on Getty Exhibit Number Twelve and plug in instead of the 23 feet, we plug in 32 feet of productive sand, it will demonstrate from the material balance calculations that the acreage drained will be something less than 262 acres, if you calculate it based upon the 23 feet of sand. That's true, is it not?

A. Well, there's a lot of things involved. Number one, that 5-billion cubic feet of primary gas production as Llano testified to in Exhibit Number Twelve, we think is substantially higher than that, and I in fact testified that it would be 11.3 down to 2000 pounds.

And, also, -- well, that's one of the big changes.

Q. Let's assume that the only thing you change in the equation is the thickness of net productive sand. If you increase the thickness you're going to decrease the calculated drained acres.

A. That is correct.

Q. If we plug in the 32 net productive feet of sand for the Getty 35 State Well, and if we substitute in your figure of 11.3 Bcf, what happens to the acres drained?

A. Well, other things have to be done, namely, the primary oil production has to be taken into consideration. Since we chopped it off at 2000 pounds

bottom hole pressure, the recovery factor would have to be decreased substantially, maybe to 65 percent. I don't know at this point in time.

And --

Q. Excuse me, I want to be sure I understand that. Are you telling me that I should take the 11.3 billion cubic feet of gas in place and reduce that by 65 percent?

A. No.

Q. Well, tell me.

A. Okay. If you put 11.3 under the column primary gas production, even though it hasn't made that yet, then if you increased in the same manner the primary oil production and equivalent Mcf, say, increase it to a comparable thing would be around 150,000, plus you change your recovery factor from a .80 down to approximately .65, the reason for that is our volumetric calculations assumed a relatively high bottom hole pressure, so there's a heck of a lot more gas in the ground that wouldn't be recovered, according to the -- those calculations.

If you do that and do not change anything else, I don't know just what number you'll come up with.

Q. You would agree it will be about 270 acres, would you not?

A. No, I don't know that it would be or

wouldn't. I haven't checked it.

Q. The information is available here on the exhibits and if we substitute in primary gas production as you've indicated, change the recovery efficiency factor, and increase the thickness of net productive sand, the Division or any competent engineer could make the same calculation and determine the acreage drained.

A. They could determine what the sheet of paper shows. Whenever you have wells 3465 feet away show a pressure response in 10 hours, I know what's going to be drained, and it's more than any 262 acres, or 278 acres. Particularly when there's no fault in that section.

Q. That Shell test back in '65 was the one between --

A. The No. 1 and the No. 4.

Q. There is nothing that would preclude that drainage pattern to be elliptical in shape to show that at least that particular Morrow Sand present in both of those wells in fact could be in communication.

A. Well, I believe that Morrow Sand present in both of those wells is in communication, and Llano has testified that other wells are in communication.

Q. Can you show us any evidence here today to indicate that that kind of response evidenced between the No. 1 and No. 4 Well is in any way characteristic to

the production of any of the other Morrow Wells in this area?

A. Well, the drainage area calculations are one thing that indicate it. Also the fact that there is a gas storage project, that there is communication, I think was testified to without exception, east-west communication is what I remember. Also we have kh values that indicate that we have good permeability. I see very little doubt that -- I have no question as far as drainage, that there will be drainage in the reservoir.

Q. What is the current statewide spacing for Morrow production?

A. There is a Rule Number 104, I believe.

Q. What does that rule say?

A. The rule has something to do with 320 acres, I believe. Am I correct?

Q. Yes, sir, you are.

MR. KELLAHIN: I have no further questions.

MR. RAMEY: Any other questions of the witness?

MR. NUTTER: I'd like to ask him one.

MR. RAMEY: Mr. Nutter.

CROSS EXAMINATION

BY MR. NUTTER:

Q. What's the status of that well in Section 36 at this time, Mr. Bosecker?

A. It is drilling and I have last Friday morning's report as to the depth, if you want it.

Q. Yeah, I'd like to know how close to being complete the well is.

A. Okay. I thought you might want to know that and I Xeroxed a copy of the -- well, Bob, you know exactly what it is. I can't find it now. Don't you know the depth of the 36 Well, approximately?

MR. WIPF: I know the approximate depth as of Sunday.

A. What was it?

MR. WIPF: Approximate depth was 12,528, as I recall.

MR. NUTTER: It's projected to about 13,000?

MR. WIPF: 13,400.

MR. NUTTER: Okay, that's fine. Thank you.

MR. RAMEY: Mr. Carr?

MR. CARR: I have just a couple of very short questions, on redirect, just to be sure that there's

no confusion as to what Mr. Bosecker has testified to.

REDIRECT EXAMINATION

BY MR. CARR:

Q. Mr. Bosecker, you do not dispute the division made by the Commission in Order R-5995 as to what should be the Grama Ridge Morrow Pool and whether it should be governed by this hearing today, is that correct?

A. That is correct.

Q. And regardless of where the Commission has drawn the division line, isn't it your testimony that that does not control where the fault is but the fault at this point is really a matter of interpretation?

A. I think that it is a matter of interpretation rather than a governmental half section line there.

Q. Is it your testimony that what you have encountered here is a typical Morrow channel sand?

A. No.

Q. And you base this conclusion on what, just very generally?

A. Very generally on the history of the area; the storage area; the information that we have on our wells.

Q. And is it your opinion that at this time the zone originally perforated in the Morrow in the Getty

Two State No. 1 is contributing substantially to the production from that well.

A. Yes, I believe so.

Q. Now we've had a considerable amount of testimony concerning material balance calculation on the Getty Two State No. 1. Is it your opinion that as the well is produced and better data is available, that you might experience changes in the results we could extrapolate using various calculations much like the changes in area drainage we can see in the Llano Government A No. 1?

MR. KELLAHIN: I'm going to object to that question. It's highly speculative; calls for a conclusion this witness can't possibly make. I would like Mr. Carr to ask his questions in a manner that's not leading, and I would object to that question.

MR. CARR: I will rephrase the question.

MR. RAMEY: All right, rephrase the question, Mr. Carr.

Q. Mr. Bosecker, is it, in your opinion, possible to accurately calculate the number of acres that can now be drained by the Getty State No. 35?

A. Volumetric reserve estimate would have to be made to start with, and everyone here knows that volumetric reserve estimates have a certain amount of error in them. So there can be errors in anybody's volumetric

reserve estimate for several reasons.

Q. Would you be in a better position to estimate the reserves at a later time after the well has produced for a longer period of time?

A. Definitely.

Q. If the Commission decides to reduce the spacing in the area east of the Grama Ridge to 320, will Getty still be able to protect its correlative rights absent a penalty being assigned to the Llano well?

A. No.

MR. CARR: I have nothing further on redirect.

MR. KELLAHIN: If I may question him for a moment.

MR. RAMEY: Okay.

RECROSS EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Bosecker, you've reached a conclusion in your Horner plots indicating that the reservoir parameters in the area of the wellbore should efficiently -- should effectively deplete a 640-acre proration unit.

Would you demonstrate to me on one of your Horner plots how you reached that conclusion?

A. Okay. That conclusion is based upon the

information obtained from the Horner plot, which is primarily knowing the heighth of the pay, calculating permeability. Permeability is very important in gas storage projects to be successful. It's very important in producing wells being successful, economic, and draining acreage.

Q. At some point in time, the Horner plot will change from a straight line plot, won't it?

A. You extrapolate the Horner plot on a straight line basis over to infinite shutin time, and in normal circumstances it does not deviate from that.

Q. How can you look at this Horner plot and determine it's draining one section, two sections, three sections, four sections, or five sections?

A. I testified as to the permeability, that the Horner plot shows is present at the wellbore.

MR. KELLAHIN: I have nothing else.

MR. RAMEY: Any other questions of the witness?

MR. CARR: At this time I would offer Getty Exhibits Fourteen, Fifteen, Sixteen, Seventeen, Twenty, Twenty-two, Twenty-four, and Thirty-two.

MR. KELLAHIN: I'm going to renew my objection as to Exhibits Fourteen through Seventeen. I believe they demonstrate a collateral attack upon the Division's order, No. R-5995. That order was entered on

May 2nd, 1979. It was the Llano case to reduce the spacing for this particular pool.

A specific finding in question in that case is finding number nine. It says that the applicant, which was Llano at that time, has established that the drainage characteristics of the reservoir in the wells completed within the aforesaid fault block are not such as to support 640-acre spacing, and that a 320-acre spacing is more appropriate for the Morrow wells completed therein.

Testimony from all those exhibits goes to the point of trying to demonstrate by the calculations that the wells within that fault lock are draining something more than 320 acres.

Getty has not taken an appeal of this particular case, and we believe that any order entered in this case has got to be founded on the premise that the wells within the fault lock are draining 320 acres or less.

MR. CARR: We submit that this is certainly not a collateral attack on a prior order. It is, however, part of the public records of the Oil Conservation Commission.

We believe it clearly reveals that when some individuals are seeking one thing, they can certainly

interpret data one way. When they're seeking to prove the opposite, they can get completely different results.

We are not offering it for the truth of the matter contained therein because the matters appear not to be true, but we do think that it clearly shows how certain data has been manipulated, and certainly we've listened all day to testimony as to how statistics can be read in a multitude of different ways, and we submit that the only thing that Mr. Kellahin has raised is some questions which might be -- might go to the weight that this Commission gives to it.

We submit that it's relevant and would be properly admitted.

MR. RAMEY: We'll take a fifteen minute recess before I rule on this.

(Thereupon a recess was taken.)

MR. RAMEY: The hearing will come to order.

The Commission will accept all of Getty's exhibits. I don't hardly see how they could be a collateral attack on the other order since it's not under attack, so to speak, but we will take them for what they're worth and

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we'll look at them in that manner.

You may proceed, Mr. Carr.

MR. CARR: At this time I would call Robert A. Wipf, W-I-P-F.

ROBERT A. WIPF

being called as a witness and having been duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CARR:

Q. Will you state your full name and place of residence?

A. Okay, I'm Robert A. Wipf, and I live in Midland, Texas.

Q. Mr. Wipf, by whom are you employed and in what capacity?

A. Okay, I'm employed by Getty Oil and I'm a development geologist in the Exploration Section of the Midland E&P District.

Q. Have you previously testified before this Commission and had your credentials accepted and made a matter of record?

A. No, I haven't.

Q. Would you briefly summarize for the Com-

mission your educational background and your work experience.

A. Okay. I have a Bachelor's of Science degree in geology from the University of Wisconsin, Milwaukee. I also have a Master's of Science degree in geology from the University of Wisconsin, Milwaukee.

My work experience in the geologic framework has been while I was going to graduate school I was employed part time by the U. S. Bureau of Mines as a geologist. After I got my Master's degree I was employed by the University of Wisconsin as a specialist working on research projects for six months, and I've been employed by Getty Oil for almost five years. I believe it's about a month short today.

The first four years I was employed by Getty Oil, I was -- Getty Oil Exploration and Production Research Center in Houston, Texas.

Q. And do you have any special duties or functions you perform for Getty Oil Company as a geologist?

A. Well, I'm a development geologist. I also have, when I was at research, got into the well log analysis branch and have spent, oh, about a year and a half doing detail well log analysis calculations.

Q. Are you familiar with the Morrow formation in southeastern New Mexico?

A. Yes, I am.

Q. Are you familiar with the subject matter of the consolidated cases which are before the Commission today?

A. Yes, I am.

MR. CARR: At this time, Mr. Examiner, I would tender Mr. Wipf as an expert witness and geologist.

MR. RAMEY: He is considered qualified.

Q. (Mr. Carr continuing.) Mr. Wipf, have you prepared for introduction today an exhibit?

A. Yes, I have.

Q. And that's been marked for identification as Getty Oil Company Exhibit Number Thirty?

A. Right.

Q. Will you please refer to this exhibit and explain to the Commission what it is and what it shows?

A. Okay. I've put this exhibit up on the wall and it is a stratigraphic cross section, and what this exhibit shows is it -- some of the Pennsylvanian formation in the area of Lea County, New Mexico.

It starts over with the Phillips Hat Mesa No. 1 Well, which is on the Pennsylvanian cross section F-F' that was put out in August of 1974, showing the Pennsylvanian tops. And the tops shown on here are the tops from that cross section.

Q. Excuse me, is that a log of a well that

is known as a marker well by the Commission?

A. Right. Okay, then we're taking across formation tops of the Strawn, the Atoka, the Morrow Lime, and the Morrow Clastics marker, which has been talked about earlier today, over from east to west, and we do have on the exhibit a map with the numbers showing the approximate -- showing the location of these wells.

Okay. When we get over into this area we have the Getty 35 State No. 1, which is in the Grama Ridge Field, the Getty Two State No. 1, in the Grama Ridge Field, and this is the -- this was the State GRA No. 1. It's one of Llano's storage areas in Section 2.

Okay. Then this last well over here is the No. 1 Federal, which is in the Red Tank area, which is again going back towards the east, and this is also on the Pennsylvanian cross section that was published in August of'74, and the tops on this are the tops that were shown on that cross section.

And the one other thing we have put on this well, I think you've noticed that we've put on symbols of which wells have been productive from the Morrow and which were dry holes, and when you read close to the exhibit from what information we had from scout tickets, is what the perfs were and what the well calculated out as initial potential. Some are calculated and some are measured.

Okay. And what we're showing here on this is that in the Grama Ridge area we have in our 35, we've shown the perfs here below what has been designated today as the Morrow Clastics marker, in through this section, and the Two State we have here, symbolized the intervals perfed. We don't have the exact number of perfs for that on hand. This shows both the interval below the Morrow Clastics marker and this interval above the Morrow Clastics marker.

And I'd like to point out that we have brought and used these coming across here. Most of these are, oh, two to three mile jumps at a time over in here, to bring the tops over. And then what we tried to do was tie this back into something and sometimes make a complete circle so if we have a correlation bust it should show up readily.

But what we do also want to show on this is that to my belief is that these perfs which are in a sand which are above the Morrow Clastics marker are within the Morrow section, and I think if you refer over here to this Phillips Hat Mesa, and take a close look, you can see that that section in through here and this perfed interval right up here, which is also a sand above the line interval which is also within the Morrow interval.

Q So is it your testimony that the upper-most perfs in the Getty Two State No. 1 Well are actually

Morrow perforated?

A. Yes. That is my testimony.

Q. Mr. Wipf, what can you tell us from this exhibit about the producing zones in the general area?

A. Well, off of this exhibit in the area in question, we have, of course, taken a great deal of look at our two wells, and also what we would expect in the general area, taking in the regional point of view. And what I see in through here in these intervals is fairly good continuity between the sand intervals in the Morrow.

Now in taking a look at what we have here, is that our deposition of environment interpretation is as I think was testified to you earlier today, is "deltaic marine".

Now what we think we have, or I should say what I have interpreted to be based on the geometry of the sand body, its position within the basin relative to how we have shoreline positions mapped, the thickness to width ratio, the general nature of the context with surrounding rocks, the content of the rocks themselves, the generally in here we have a quartzite sand. We have seen some indications of calcareous dolomitic cement. We have seen also from a few samples on which we took X-ray work, we have seen that there is some kaolirite (sic). We also have some chloride in the samples and some expandable

mixed layer clays.

And using all this data put together, we think that -- or I should say I think -- that the upper -- that this interval, I think, which was referred to as sand interval four this morning --

Q. Which well are you talking about now?

A. I'm pointing right now to the Getty 35 State and this is the interval between 12 about I think it's 907 to 920 something. On this scale it's a little bit difficult to tell the depths.

But that interval is in a barrier beach environment and some of this lower area in here we believe is in a pre-delta environment, and in these environments we would expect rather good continuity within the sands. There would be thickening or thinning there, but the continuity within each individual sand body over a reasonable distance should be fairly good.

But these do not appear to be channel sands.

Q. Mr. Wipf, I'd like for you to direct your attention again to the Getty Two State No. 1 and the uppermost perforations in that.

A. All right.

Q. And ask you if it is possible in your opinion, limited by sound geologic principles, to character-

ize those perforations as Atoka, and what would the effect be if you tried to do so?

A. Well, I don't think I could characterize those as Atoka, and one of the big problems in putting it as Atoka would be in taking some other regional cross sections we have in this area, and there have been -- using also several published reports in the area, we could not tie in to what we're surrounded with in the area.

Q. In your opinion in this well are both the uppermost perforations and the top -- uppermost zone in the Morrow Clastics contributing to production of the well?

MR. KELLAHIN: Excuse me, which well are we looking at?

MR. CARR: At the log of the Getty Two State No. 1.

A. Okay, in the log of the Getty Two State, and this is from the interpretation of the log, I would believe that both the perfs above this Morrow Clastics marker and the perfs in the section below the Morrow Clastics marker would be productive.

Q. Mr. Wipf, have you included in this exhibit the logs of both the Getty 35 State No. 1 and the Getty Two State No. 1?

A. Yes.

Q. And based on your review of these logs, in your opinion would both these wells be able to drain 640 acres?

A. Based on the geologic data and based on looking at the logs, I believe that they could drain 640 acres.

MR. CARR: I have nothing further of Mr. Wipf on direct.

MR. RAMEY: Any questions of Mr. Wipf?

MR. KELLAHIN: Yes, sir.

MR. RAMEY: Mr. Kellahin.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q. Let me ask you, Mr. Wipf, if you'll identify those wells on your cross section that produce above the top of the Morrow Clastics.

A. Okay, above the top of the Morrow Clastics as far as my data goes through scout tickets information, we have the Getty Two State No. 1, and we have the No. 1 Hat Mesa.

Q. That's your Phillips type log from the far left of the cross section.

A. Yes, right.

Q. Those are the only two wells.

A. That are productive at this date.

MR. KELLAHIN: I have nothing further.

MR. CARR: I have one further question.

MR. RAMEY: Mr. Carr.

REDIRECT EXAMINATION

BY MR. CARR:

Q. Mr. Wipf, in your opinion is it possible that there are zones in the Getty 35 State No. 1 Well that if perforated could produce from above the top of the Morrow Clastics?

A. Yes. In fact, when I wrote the recommendation letter for perfs, I did recommend the same correlatable interval. It does not show up good on here, but it's right in here in the Getty 35 State.

MR. CARR: I have nothing further.

MR. RAMEY: Any other questions of the witness?

RECROSS EXAMINATION

BY MR. KELLAHIN:

Q. Where on your cross section do you place the top of the Morrow, Mr. Wipf?

A. Right where this -- where we have this Morrow and this L. for the lime.

Q. All right.

A. Okay?

Q. Yes. Thank you.

MR. KELLAHIN: That's all.

MR. RAMEY: The witness may be excused.

MR. CARR: That concludes our case.

MR. RAMEY: Thank you, Mr. Carr. Mr. Kellahin.

MR. KELLAHIN: Yes, sir, I'll call Mr. Klaar.

AL KLAAR

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Will you please state your name, by whom you are employed and in what capacity?

A. My name is Al Klaar, K-L-A-A-R. I work for Llano, Inc. out of Hobbs, New Mexico, as Manager of Engineering.

Q. Are you a professional engineer or petroleum engineer?

A. I have a degree in petroleum engineering

and fifteen years of experience, yes, sir.

MR. RAMEY: Mr. Kellahin, the Commission does consider Mr. Klaar qualified. You may proceed.

MR. KELLAHIN: Thank you.

Q. (Mr. Kellahin continuing.) Would you please refer to what we've marked as Exhibit Number One, for Llano, and identify that?

A. I hope the Commission will bear with me. I will try to be very brief.

Exhibit Number One illustrates the area in general. It shows all the main wells and main drilling wells at this time.

In red it -- first of all in yellow it indicates the area which prior to the March 14 hearing had been designated as the Grama Ridge Morrow Field on 640-acre spacing. Inside the red boundary it indicates the Commision's determination subsequent to the hearing in March that the Grama Ridge Morrow should be reduced to that area at 320-acre spacing.

At the same time, by Order Number 5995, the Commission placed the area bounded by the blue mark on that temporary 640-acre spacing, and that's what this hearing is all about today.

Q. Let me lead you a bit through this exhibit here, Mr. Klaar.

A. Yes, sir.

Q. Llano is appearing in opposition to Getty's application that the area between the blue line should be spaced on 640 acres, is that not correct?

A. That is correct.

Q. In addition you are seeking approval of a location that is 660 feet from the east line of Section 34 and 1650 feet from the south line of Section 34.

A. We have that approval but we do not have any acreage assigned to it as of this moment, correct.

Q. Now, with regards to the approval of that location, was that the subject of the hearing before Examiner Nutter on March 14, 1979?

A. Correct.

Q. And pursuant to that case, did Llano receive an order?

A. Yes, sir, we did.

Q. And pursuant to that order did you commence drilling a well at that location?

A. We did, and we're at the present time drilling at a depth of approximately 3000 feet.

Q. Do you have a recommendation to the Commission with regards as to how the area in blue ought to be spaced?

A. Yes, sir. My recommendation is that being

Morrow, being Pennsylvanian gas, first of all, and Morrow secondary, it should be spaced on 320-acre spacing.

Q. In the event the Commission approves 320-acre spacing, in what if any ways would your location in the east half of Section 34 be a non-standard location?

A. It would be non-standard to the tune of being 330 feet closer to our own lease. It would be a standard location with respect to going eastward towards Getty's lease.

Q. If the Commission approves a 640-acre spacing for this particular area, then in addition to being at an unorthodox location, you also only -- you also have to have approval of a non-standard proration unit, is that not true?

A. Correct, and that is the third part of this case since everything got consolidated.

Q. All *right*, sir. Would you refer to Exhibit Number Two and identify that?

A. I think we have seen many variations of Exhibit Number Two today.

Q. All right.

A. And this happens to be one of them.

Q. This is the same exhibit that Llano introduced before Examiner Nutter back in March of '79.

A. Yes, sir.

Q. You've not changed any information on here except with regards to the outline of the different acreage.

A. That -- that is correct. The idea to show here is that how does the acreage that has been set aside and put on temporary 640-acre spacing, how does it fit into the scheme of things with respect to the faults, with respect to the structure to get the Commission oriented to what area we're talking about.

Q. Let me ask you to outline for us what areas Llano operates and how.

A. Llano operates, as shown on here, four underground gas storage wells, No. 1 in Section 3; No. 2 in Section 34; No. 3 in Section 33; No. 4 in Section 4.

Also Llano operates another well, the Government A No. 1 down in Section 10. I think it might be appropriate to mention that prior testimony indicated that we have a divergence of opinion with just how much gas the Government A is capable or will be capable of making under primary production.

Q. Let me ask you about that in a moment. Would you first indicate for us who the owner is in Section 9?

A. The owner of Section 9 is not shown, but that is also owned by Llano. There is no well, no deep

well, in that section.

Q. When were the four storage wells converted from producing wells to storage wells?

A. In 1973, the first one April of '73 and the second one December of '73.

Q. Are they still operated as storage wells?

A. Yes, sir, in fact the system couldn't do without it.

Q. Are those four sections involved in any way committed to any type of unit?

A. Yes, they are.

Q. What kind of unit are they committed to?

A. In -- at the beginning of 1973, since Section 3 and Section 34 are State leases, we -- it was incumbent upon us to reach an agreement with the State of New Mexico to form a unit for gas storage purposes.

Q. Do you have such an agreement with the State of New Mexico?

A. Yes, we do.

Q. And when was that executed?

A. As I remember, it was during the first quarter of 1973. I think it might have been April 26th.

Q. Is that acreage still operated under the unit agreement?

A. Yes, sir, it is and it has subsequently

been expanded to include the State leases in Section 33.

Q. What, if any, requirement do you have under the operating agreement with regards to wells to be drilled in the east half of Sections 34 and the east half of Section 3?

A. The obligations placed on us through the unit agreement that the State drew up, and which we signed with them to form this unit, were not necessarily -- those obligations were not necessarily restricted to any part of the acreage. It was a general obligation and that obligation states, as brought out at the last hearing on page 12, Section 14 of the unit agreement, it says, in the event a well or wells producing oil or gas in paying quantities should be brought in on land adjacent to the unit area, draining unitized substances from the lands embraced therein, the unit operator shall drill such offset well or wells as a reasonable, prudent operator would drill under the same or similar circumstance.

Q. What offset wells were of concern to you?

A. In time each of the offset wells was of concern. Of special concern were the east offset wells, namely the Getty Two State in Section 2 and the Getty 35 in Section 35.

Q. Were you here in the hearing when Mr. Bosecker testified today?

A. Yes, sir.

Q. Did you hear his testimony where he indicated that he believed that there's Morrow reserves in the east half of Section 34 and in the east half of Section 3 that had not been produced by the storage wells while they were producing wells?

A. Yes, sir, I did.

Q. Do you concur in that recommendation?

A. Yes, I do.

Q. Would you explain to us the status of the well in Section 10 to the south of the four storage wells?

A. The well we're talking about is the Government A No. 1 in Section 10. We have, as I started to point out, we have a divergence of opinion on how much primary gas this well will make.

It became obvious in 1978 that, not only was there communication between our two injection wells, No. 1 and No. 2, going westward, but one of those two injection wells was also contributing to what we call a buzz towards the south, toward the well in Section 10, the Government A No. 1.

The immediate concern, of course, was that the gas that is stored underground has already been paid for one time. So if a buzz is occurring, and we have con-

vinced ourselves that it is, we would naturally wish to convert this well as soon as possible to an additional storage well.

In the exhibits, and I don't remember exactly which one -- number it was, where Llano assumed that the Government A made 1.5 billion cubic feet. That was derived from the fact when we saw the buzz that was occurring, in other words, instead of the pressure continuing to drop and the production declining, as it had done for the past eight to ten years, the production increased and the pressure increased, we continued the old decline and came up with the 1.5 billion cubic feet that this well would have produced, would it not have received a buzz from our storage system.

At the same time we had the obligation to get with our purchaser to see that he would agree that this had really taken place, which our purchaser did, by the way, and jointly the purchaser and Llano have made application to the Federal Energy REgulatory Commission in January of this year, giving in detail our, what we consider remaining primary reserves as of September of '78, and that we wish to take this well, disconnect it from the interstate market and convert it to intrastate underground gas storage well.

This occurred about five months ago and

we have called several times and we don't know exactly where our application is.

The point being that I find -- I can find nothing wrong with the numbers that Getty came to when they looked at the primary production, but about a year and a half to two years of that was not primary production.

Q. Would you describe for us the significance of the fault line located in the approximate center of Sections 34 and 3?

A. Upon the Getty Two State and the Getty 35 being completed and indicating virgin Morrow pressure, we were of course delighted to find out that this was not simply dues to a permeability pinchout and reappearance toward our well, but more than likely it was due to what Mr. Bosecker termed a sealing type fault.

Q. How do you know that that's not a permeability barrier as opposed to a sealing type fault?

A. That is strictly in talking to Getty. We did not run any seismic data. That estimated location of the fault has been furnished to us by Getty.

Q. Would you look at Exhibit Number Three, now, please? Would you identify this exhibit?

A. Exhibit Number Three is the same type of exhibit that Llano has presented prior to this at the March hearing. It was built strictly on the basis of what

was and what is productive below the top of the Morrow Clastics.

Q. Let's take a shortcut here, Mr. Klaar. This is the same exhibit that Getty introduced as their Number Twelve Exhibit, I believe.

A. Correct.

Q. Now, let's go down to the calculated drainage areas.

A. Mr. Kellahin, would it be appropriate at this time to mention something about the top of the Morrow Clastics with respect to other things, especially what the last witness of Getty brought out?

Q. Well, I think we ought to hold that for a moment and let me ask you some questions about the Exhbit Number Three.

A. All right.

Q. You've done some material balance calculations and you've come up with some calculated drainage areas for each of the wells depicted on the plat.

A. Right.

Q. Do you recall this morning Mr. Bosecker testified that but for the existence of the fault line, the east fault line in Sections 34 and 3, and the fault line to the west through Section 33 and 4, that the storage wells would have drained 640 acres. Do you recall that?

A. Yes, I recall that testimony.

Q. Do you agree with that testimony?

A. Not necessarily. That the faults definitely place a barrier to the east and to the west, there's no doubt about that, but a lot of their testimony depicted drainage areas as something completely circular, as something that is uniform, as an area that can be ascribed to by one number, like a radius. We all know that none of the things in nature are exactly that way.

The other thing is there is no barrier such as a sealing fault to the south of the upthrown block there between the two faults. We have, and as was introduced, testimony to the effect that Llano presented and said that there was a permeability barrier somewhere in the north there, which can be or cannot be there.

I wish to point out at this time that that type of data was presented by -- by Llano shortly after obtaining and buying these wells, and was presented at the initial hearing getting the storage system off the ground, getting approval for it.

With the advent of people drilling around our storage area we are continuously looking at and trying to interpret all our data that we can possibly get our hands on relative to the storage area and anything outside of it, and we have now come to the conclusion of those two

faults with no known barriers either to the north or to the south.

So it would not have restricted us, the two faults in themselves would not restrict us but just producing 320 acres. We could have, if it was available, we could have produced 640 acres, drained 640 acres.

Q. Did any of those wells drain 640 acres?

A. Not according to my calculations, they didn't.

Q. What precluded them from doing so?

A. I think what precluded them is being typical Morrow. I do not agree with this being a channel -- a deltaic-type sand. I think the Morrow in general is consisted of consistent anywhere from two to six or seven different and isolated and separated sand bodies, which when looked closely at, each sand body by itself will even show a separate pressure in each sand body.

Q. What familiarity do you have with Morrow wells in general in southeastern New Mexico?

A. My familiarity ranges through the fact of having been for the prior year and a half to two years before I started with Llano working for Amoco Production as drilling engineer and drilling about fourteen or fifteen Morrow wells.

After going to work for Llano, at the

time I went to work there Llano had approximately forty to forty-five Morrow wells connected to its intrastate gas system, gas gathering system, and at this time Llano has more than 100 wells connected to its intrastate gas system, and it is not unusual for me to run into a seller telling me he's got a well that will make 12 billion cubic feet, and three years later I call him and I tell him it only made four.

Q. In looking at the Exhibit Number Two, there has been testimony introduced today that back in 1965 Shell had an interference test between storage wells 1 and 4.

You have testified just now that you believe that the Government A No. 1 Well may be receiving a recharge from the storage area.

A. Correct.

Q. Do you have an opinion as to whether or not those wells would be in communication and still not drain 640 acres?

A. Yes, I do. Based upon the fact that we have made a thorough study of each separate sand in the Morrow and have identified them, either by letter or by name, and have found wells, one well to have only one sand, and none of the offset wells to have that same particular sand, but yet on the other hand, we have found wells a mile

or mile and a half apart to have, say, the A Sand in both wells, the point being that the sands come and go, and I think we can illustrate that fact with a further exhibit with later testimony.

The further point being that the sands come and go, I think it is highly suspect to assume that you can drill one well on one section and drain everything that's there.

Q. Would you please refer to your Exhibit Number Three and look at the calculations for the Getty 35 State No. 1 WEll.

A. Yes, sir, that was the one where we -- where I calculate 262 acres.

Q. Yes, sir. Do you recall Mr. Bosecker's testimony this morning that he attributes some 11.3, I believe, billion cubic feet of gas in place to that particular well? I note by your exhibit that you only have 6.3.

A. Correct.

Q. Would you explain -- would you explain how you come to a different opinion as to the gas in place?

A. I assume that Mr. Bosecker started out with the calculated absolute open flow and arrived at that 11.3.

I also started out by looking at the cal-

culated absolute open flow, but I analyzed how it was obtained.

I derated the calculated absolute open flow down to what I call an initial stabilized producing rate once the well has been on for a week or two. After that, knowing what in general wells, how they will decline, I apply the decline factor, and then I have all the data necessary to obtain reserves.

Q. What was the decline factor used in your calculations?

A. The Morrow in general in the two districts down in southeast New Mexico declines at 30 to 35 percent per year.

Q. On what do you base the accuracy of that calculation?

A. Upon the more than 100 wells that Llano is connected to and the production plots we keep on each one, and averaging the decline curves once a year when it is incumbent upon us through one regulatory body or another to -- to furnish reserves.

Q. In your opinion is that an acceptable and accurate method for determining ultimate producable reserves to be attributed to a Morrow well?

A. Yes, sir.

Q. Based upon your experience and knowledge

of this particular area, Mr. Klaar, do you have an opinion with regards to how much gas in place is necessary for a Morrow well in order for it to effectively and efficiently drain 640 acres?

A. Let me think for a minute. I'm trying to see if I understand your question. Your question is -- I think you might want to rephrase that question, please.

Are you talking about any particular well, first of all?

Q. I'm referring to the 35 --

A. Okay.

Q. The Getty 35 State Well.

A. All right, I think I follow your question, then.

Since we assume, since I assume that 6.3 or 6.4 billion original gas in place, and entered that into the calculations to obtain drainage, a drainage area of 262 acres, in order for that well under the same conditions, meaning the same thickness of net pay, the same porosity, and all of the other factors, to drain 640 acres, it would take approximately 15-1/2 billion cubic feet, which, of course, is the difference in our thinking. I'm of the opinion that the well has 6.3 billion cubic feet original gas in place, and Mr. Bosecker, if I understood him right, is of the opinion that it had 11.3 either original or pro-

ducable.

MR. BOSECKER: Producable.

A. Producable, I stand corrected.

So his original gas in place would even be higher than the 11.3.

Q. Base upon your experience, Mr. Klaar, how often do you encounter a Morrow well that is capable of producing 15.5 billion cubic feet of gas?

A. No more than one time out of a hundred.

Q. What is the general spacing now for Morrow pools in southeastern New Mexico?

A. We have a further exhibit which shows that ninety percent of the fields are 320-acre spacing.

Q. Would you look at Exhibit Number Four, please?

A. Yes, sir. Exhibit Number Four is the same exhibit that was presented originally at the March hearing, plus was presented this morning by Getty. IT graphically illustrates what happened in the Grama Ridge Morrow Pool prior to Getty or Pogo drilling down to the Morrow horizon.

Wells, five wells were drilled. Four of them were essentially depleted and two of them are illustrated how they depleted, and those two are our present injection wells, and then in April of '73 injection operations were initiated, and by the time 1976 came about, we had approxi--

mate -- an average approximate pressure in the reservoir of 4,000 pounds again.

In 1978, as indicated by the red diamond there, the Getty Two State had a bottom hole pressure of 8224, that we're in agreement with Getty.

Q. Will you look at Exhibit Number Five and identify that?

A. Exhibit Number Five is in the order of drilling of the Grama Ridge Morrow Pool, first well through last, and the initial bottom hole pressures encountered in each well.

Our GRM Unit No. 4 was the first one drilled and tested and it had a bottom hole pressure of 7658.

The No. 1 had a bottom hole pressure of 7611. The No. 2, bottom hole pressure of 7682. The Government A No. 1, bottom hole pressure of 7300. GRM Unit No. 3, 7880. Then we come to the Getty Two State, which on the 14th of February, 1978, had a bottom hole pressure of 8224.

I --

Q. Would you -- can you identify for me on -- using Exhibit Number Five from what Morrow Sands those particular wells produced from?

A. Before I do that I think it would be

appropriate to say at the time we came to the March hearing we looked at the Morrow as starting at the top of the Morrow Clastic. We do not argue about where the top of the Morrow is. As the exhibit on the wall shows there, the top of the Morrow is at what's labeled Morrow Limestone. That's fine with us. There's no problem there and I'm sorry we labeled the sand immediately above the Morrow Clastic as, and called it, Lower Atoka.

In our further exhibit, in another exhibit here we will show we've amended that to show either Upper Morrow or Lower Atoka. It makes no difference to us.

Q. All right, sir.

A. Now, to get to your question. The No. 4 Well, and this is, I think, where the difficulty comes in, because prior to the Getty Two State being completed, there was no known well in the immediate area that produced from the Morrow above the Morrow Clastic. So we started with the first sand below the Morrow Clastic as the A zone.

The next sand that was found structurally downward was labeled the B Sand, and so on.

We have identified five different zones below the Morrow Clastic, A through E.

The No. 4 Well produces from the A and the E, none of the ones in between, or produced from the A and E.

The No. 1 Well produced from the A, the B, and the E.

The No. 2 Well produced from Zone B, like in boy, D, and E.

The Government A Well is only capable of producing at this time, and never did produce from any other zone, but the B.

The No. 3 Well produced and is now storing gas in zones A, C, and D.

The Getty Two State, whether you want to call it Lower Atoka or Upper Morrow, we don't care, is producing from the zone up above the Morrow Clastic and Getty contends it's producing from some zones below the Morrow Clastic.

Q. Do you agree with that contention?

A. No, sir.

Q. How about the 35 Well?

A. The Getty 35 produces from what we classify as zone A and D.

Q. Okay.

A. And the Pogo Well produces from zone A only.

Q. All right.

A. I think this will show up graphically much better on a following exhibit.

Q. Would you identify Exhibit Number Six and tell us what that is?

A. Exhibit Number Six shows the calculated absolute open flows that were obtained and were submitted to the Commission at the time these wells came on line and were productive.

The points to note on this exhibit are that the GRM Unit No. 1, for instance, had a calculated absolute open flow of 26,500 Mcf a day but yet in reality, barely produced 7 billion cubic feet.

The GRM Unit No. 2 had a calculated absolute open flow of 34,200 Mcf a day and did not quite produce 6 billion cubic feet.

Conversely, we are now to understand that the Getty 35, who had a calculated absolute open flow of 11,107 will produce 11.3 billion cubic feet. We disagree with that. We think the well from the Morrow will produce approximately 5 billion cubic feet.

Q. Have you studied the pressure and production information from the Getty Two State No. 1 Well and the Getty 35 State No. 1 Well?

A. Yes, sir, I have.

Q. In your opinion is there any evidence of communication between those two wells?

A. No, sir.

Q. Would you look at Exhibit --

A. That does not mean that in the future there could not be with the same, and as has been testified to, if the same zone up above the Morrow Clastic is perforated in the Getty 35. It is very possible that there will be communication in that zone. But as -- what I know right now, what has happened on the two wells, I do not think that there is communication between the two wells.

Q. Would you look at Exhibit Number Seven and identify it?

All right, Mr. Klaar, would you identify Exhibit Number Seven and tell us what this contains?

A. Exhhibit Number Seven shows on a structure map hung on a -8500 feet subsea, the known wells in the Grama Ridge Morrow plus the immediate offsets to what is now defined as the Grama Ridge Morrow Field.

The points of interest as presented by Getty are, of course, the two faults, one to the left there, which is between the Pogo Well and Llano's storage system. The other one is between Llano's storage system on the east side and Getty's Two State and Getty's 35 State.

The important thing that this exhibit should illustrate is the fact that these wells were drilled and sand bodies were identified as per log, core, and other data, and these sand bodies are identified in yellow, but

yet the actual productive sands are identified on here in red.

The conclusion that, if you see a blue indicator in there, you're actually looking at what has been tested and has been concluded to be water. And if you see a sand body without any red in there it has been through past practice identified as being nonproductive, being too tight.

I think this cross section clearly illustrates by the GRM Unit No. 3, the second well on the left, that each of these sand bodies is essentially a reservoir unto itself. How else can one explain the fact of testing water in what we labeled the B Sand and then finding gas production below, unless and until you reach the conclusion that these sands are separate reservoirs unto themselves.

It is not Llano's intention to come here and say that each one should be classified as a separate reservoir. It is Llano's intention to show that the sands come and go and have their own characteristics, their own producing characteristics, and that it is highly unlikely to drill one well on 640 acres and say you are going to hit and produce everything that has a possibility of being there under that 640 acres.

Q. In your opinion does the porosity and thickness vary between wells within the separate Morrow

stringers in this particular area?

A. Yes, it does. I think that's illustrated by going from the No. 3 through the No. 4, which was not productive in the B Sand, over to the No. 2, which was productive again in the B sand. Then going further over and finding out the sand petered out altogether and was not even there once you got to the GRM Unit No. 1.

Q. In your opinion are the Morrow stringers involved here continuous across the entire area?

A. I would not say that they are, no, sir. There might be one zone -- just a minute -- the E zone. The E zone is just about the only one that makes it from just about one side to the other.

Q. In your opinion does production occur in this particular Morrow Pool in individual lenses scattered through the Morrow formation?

A. Yes, sir.

Q. Into how many general intervals of sand deposition have you divided the Morrow in this area?

A. We have divided it into five sands below the Morrow Clastic and one or two sands above the Morrow Clastic, depending on where the top of the Morrow is really picked.

Q. Do all those sands produce in all of the Morrow wells that penetrate those sand bodies?

A. No, sir, they do not. In fact, there is not a single well that produces in all sands, and that -- that is the whole crux of the matter, that if you restrict yourself down to saying one well at 640 acres, you're saying that you will -- you will find everything there is to be found in that 640 acres with one well.

Q. In your opinion --

A. And I'm doubtful whether really 320 acres will find all the productive sands that are possible out there.

Q. In your opinion is this a typical Morrow production generally found in southeastern New Mexico?

A. Yes, sir, very typical.

Q. Any other comments with regards to Exhibit Number Seven?

A. None at this time.

Q. Okay. Let's look at Exhibit Number Eight and have you identify that for us.

A. Exhibit Number Eight is not intended to be an all-encompassing type analysis because it was restricted to looking at one month at the statistical reports and going through the individual gas fields that were identified as Morrow for that particular month and the field rules, and finding out what type of spacing they were working, or they were operating under.

In no way am I trying to say that these are all of the Morrow Pools in District One and OCD District Number Two, simply because this is based just on one month's statistical report, but it does show --

Q. What was the month of the statistical report used to make the tabulation?

A. As I remember, it was January, '79 that was used.

Q. And that tabulation shows a total of how many Morrow Pools in both districts?

A. Well, in District Number One it showed a total of twenty-five identifiable Morrow Pools with twenty-one being on 320-acre spacing and four on 640.

In District Number Two we identified seven, out of the gas section of the statistical report, we identified seventy-seven Morrow Pools with seventy being at 320-acre spacing and only seven at 640.

The further conclusion is that upon identifying which of these pools were at 640-acre spacing, it became evident that most of them were either, number one, one well fields or, number two, no activity had taken place there in the last six to seven years to make it incumbent upon an operator to ask for less than 640 acres.

Q. Let me have the exhibits on your unorthodox location.

Q. All right, Mr. Klaar, would you please refer to what I've marked as Llano Exhibit Number Nine and identify that?

A. Yes, sir. Llano Exhibit Number Nine is an application by Minerals, Incorporated. It is labeled as a well location and dedication plat, and another way of putting it, Minerals is us. It just happens to be the gas drilling and producing segment of Llano.

Yes, it is a Form C-102, which shows the location applied for and given approval to by the -- through the Examiner Hearing, to which no acreage has been dedicated yet.

Q. Minerals, Inc. is a subsidiary of or a part of Llano, Inc.?

A. Sister, brother, whatever you'd like to call it. Cousin.

Q. What -- what does Exhibit Number Nine show me?

A. Well, it shows the -- Exhibit Number Nine shows the two state leases involved in the east half of Section 34, which Llano wishes to dedicate to this well, being 320 dedication, to be drilled through the Morrow formation on the east side of the fault.

Q. Do you have an opinion with regard to the cost of this particular well?

A. The opinion only goes so far as if everything goes all right, it's going to cost 1.8 million. If things go awry, there's no telling how much it will cost.

Q. And why have you chosen this particular location?

A. The location was chosen not only for the Morrow. The location was chosen based upon all of the factors which make up the geology of the area, they being the fact that the Bone Springs is productive. The Strawn has been tested by Getty to be productive, even though not perforated, and by Pogo it's also the Strawn has been tested and found to be productive.

There's one or two zones in the Atoka. Now this is the Atoka that is above what is labeled by Getty the Mississippi Limestone. And last but not necessarily least, the fact that when Getty drilled the two wells to the east, they found virgin Morrow immediately above the top of the Morrow Clastic and below the Morrow Clastic, so that also influenced us in locating the well and requesting an unorthodox location at 660 from the east and 1650 from the south of this section.

Q. Let me have you look at Exhibit Number Ten.

A. Exhibit Number Ten is a small scale plat of the area again showing if 320-acre spacing becomes the

norm in this pool, then Llano would have the right to drill a well at the place marked in black. Llano came in, and due to the next exhibit, as the next exhibit illustrates, asked to move that location 330 feet further south.

Q. Let's look at Exhibit Number Eleven.

A. Exhibit Number Eleven illustrates in general where the area got its name, Grama Ridge, and the closest legal location is the one that appears as 660 from the east and 1980 from the south of the section, which would place it in the middle of that ridge and which would have cost us an additional amount of money to build the location there.

Q. That would be a standard location if the well spacing was 320 acres.

A. Correct.

Q. What was the cost of building the location if you'd commenced at the nearest orthodox location for 320-acre spacing?

A. It was passed down to us as a bid. Bids were obtained on the two locations and as the next exhibit shows, it was passed on to us of $31,000 versus $16,000 for the one to the south.

Q. Would you identify Exhibit Number Twelve for us?

A. That is the exhibit that I just made

reference to, that a dirt contractor submitted the two bids to us.

Q. In your opinion, Mr. Klaar, is the requested location the optimum location within the east half of Section 34 in which to drain Morrow production?

A. It is not only the optimum location to drain Morrow production, it is also a legal location in the Bone Springs, which is productive. It is also a good location for the other zones in between. It was a matter of taking the four or five producing zones in the area, overlaying same, and looking at it from a three -- as though it was a three-dimensional type piece of work, and in picking the best location.

And we chose, and we're still of the opinion that this is our best location.

Q. Do you have an opinion with regard to whether a penalty factor of any kind ought to be assessed against Llano because of this location or because of the number of acres to be dedicated to this particular well?

A. The problem comes down to whether it goes 640 or whether it goes 320. If it goes 640, I definitely think that the Commission will and rightfully so, put some type of a penalty factor on there, whether they do it through proration or just once every six months, or once a year. Llano has no objection to that.

If it goes, if the spacing goes to 320, Llano does not think that we should incur a penalty because we are with respect to the offset operator, specifically Getty, we would be in a legal location with respect to their particular lease line.

Q. Mr. Klaar, do you have an opinion as to whether or not Getty can develop Section 35 and Section 2 on 320-acre spacing without adversely affecting their interests?

A. From the standpoint of being a driller, a drilling company, and an operator, I would think GEtty would want to develop Section 2 and Section 35 on 320-acre spacing to be sure that they encounter each and every Morrow zone first of all, and possibly other zones in the Atoka, which they might not encounter with one well in the section. That's why I find it hard to believe that Getty is of the opinion that they can drain a whole 640 acres with one well.

Q. In your opinion is the Getty well in Section 35 draining 640 acres, or capable of draining 640 acres?

A. No, sir, I do not think it's capable of draining 640 acres.

Q. How many acres do you think the Getty 35 Well is capable of draining?

A. Using the same type of analysis that we looked at retrospectively at our wells, using the same type of parameters, I'm of the opinion that the well will drain somewhere between 250 and 300 acres.

Q. I want to show you Getty's Exhibit Number Thirty-one and ask you to examine that exhibit.

A. Getty's Exhibit Number Thirty-one, if I understand it correctly, identifies the radius of drainage based upon the fact that their wells are located, two of them, 1650 feet away from their lease line. In each case they are located at 1650 feet away from the west line of the section.

Q. Assuming a circular radius of drainage, what would be the radius of drainage for a 640-acre unit?

A. If a well drains 640, is that -- the radius of drainage would be approximately 2950 to 3000 feet. Which, by the way, would go across the lease line and would --

Q. Into what sections?

A. Well, from Section 35 it would end up going approximately 1300 feet over into Llano's -- Llano's lease. Interesting. If it drains a circular 640, bui I'm not saying that these wells will drain a circular 640.

Q. I'd like to show you what has been intro-

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duced as Getty Exhibit Number Twenty-seven and ask you if you have any comments with regards to that exhibit?

A. It is Exhibit Number Twenty-seven, is a production plot by days, not necessarily for each day but for the days that they had data on for the Getty Two State Number 1, starting with July of '78 and ending sometime in the latter part of December of '78.

A few days into June, I would imagine that would be about eight or nine days into June, it shows that the well produced gas at the rate of approximately 1-1/2 million, or 1.5 to 1.6 million a day, and throughout this whole period produced never less but always a little bit more than 1.4 million a day.

Q. My question for you, Mr. Klaar, is that you recall Mr. Bosecker's testimony that the increased condensate production for the Getty No. 2 Well in his opinion was attributable to the lower sands below the top of the Morrow Clastics now coming into production in that well.

Do you agree with that opinion?

A. No, sir, I heard the testimony. I do not agree with it.

Q. But what in your opinion is the condensate production attributable to?

A. The condensate production shows about the 11th or 12th of July, it showed coming up from zero,

or essentially zero, up to 12 to 13 barrels a day. That's what this graph shows. In reality the well since the first day has produced condensate.

Q. What has happened to that condensate production?

A. That condensate went through Llano's meter, and since Llano is paying on an MMBTU basis, that condensate was paid for to Getty and Llano collected it a couple of miles down the line at its dehydration station.

Q. Do you know if and when a separator was placed upon that well?

A. About the 10th or 11th of July, of 1978.

Q. I'll show you what was introduced as Getty Exhibit Number Fifteen. That was the net pay Isopach Morrow porosity map made in 1972.

A. Yes, sir. This was a little bit before my time.

Q. I understand. What's the number, Fifteen?

A. It says Exhibit Fifteen.

Q. Do you recall Mr. Bosecker's testimony that based upon Exhibit Number Fifteen he then prepared a material balance calculation and that was introduced as Exhibit Number Sixteen.

A. Yes, sir.

Q. Would you now look at your Exhibit Number

Three, which has been introduced as Getty Exhibit Number Twelve.

A. I've got it. Yes. And the point has been brought up that there is a discrepancy.

Q. Obviously. So my question is whether or not the porosity cutoff factor used in the Isopach in '72 is the same or different from the porosity cutoff factor used in your calculations to make Llano Exhibit Number Three.

A. Okay, I can testify to Llano's Exhibit Number Three here, that I know what the porosity cutoff was.

Q. What was that?

A. 5.5 percent.

Q. Okay, would you continue?

A. Obviously, the porosity cutoff in 1972 was a different number.

Q. Okay.

A. Now when we talk in terms of a half or a full percent of porosity cutoff change, possibly changing the thickness by as much as 25 or 30 percent, we're talking in terms of what has in one instance been counted as five feet of pay at 5-1/2 percent porosity, was counted as a 6 percent cutoff of zero feet of pay at 6 percent cutoff. So I am not certain on who made this determination, except

the fact that outside consultants were utilized in -- in building Llano's case at the time to come to the Commission. Llano was quite a bit smaller at that time in 1972 than they are now.

Q. Looking at your Exhibit Number Three --

A. Yes, sir.

Q. -- it indicates a thickness of net productive sand.

A. Uh-huh. Correct.

Q. Did you pick those net productive sands thicknesses from logs?

A. Not completely from logs; that was the starting point. Logs was one. Core data was another. Samples and well logs as obtained by geologists sitting on wells was the third. It was a combination of several items which contributed to determining what was net productive pay, and I want to state that this was done from an engineering standpoint, not from a geological standpoint. This the way an engineer would lock at it with what is productive and what is not productive.

Q. Are you referring to Exhibit Number Three?

A. Yes.

Q. In your opinion as a petroleum engineer, which exhibit, Exhibit -- Llano Exhibit Number Three or Getty Exhibit Number Sixteen, represents the most accurate

pick of the thicknesses of the productive sands for those wells?

A. As Mr. Bosecker pointed out, as time continues and you are the owner and the owner of facts as they come rolling in, I certainly think that our latest interpretation is more accurate than our early interpretation, and Llano had just purchased the wells two months prior to that.

Q. Are you familiar with the Horner plot, Mr. Klaar?

A. Somewhat, yes, sir.

Q. All right, sir. Let me show you Getty Exhibit Number Nineteen and Getty Exhibit Number Twenty.

In your opinion can you examine the Horner plot and reach the conclusion indicated on the data sheet that the well is depleting a 640-acre proration unit?

A. As I understand the Horner plot, it -- there is no cut and dry way that it will show you what total acreage is being drained by any one particular curve, whether this be this one right here or any other plot.

It does give you, a Horner plot does tell you it takes time and converts it to some formula of distance and says something is happening either close to the wellbore, a little bit further away from the wellbore, or quite a bit away from the wellbore, but as I understand it,

it never says that it is exactly 17-1/2 feet or 1726 feet away from the wellbore.

Q. Let me show you Getty Exhibit Number Twenty. That is the data sheet used for the Getty No. 2 Well, and the Horner plot run on February, '78. I direct your attention to the summary of kh calculations. Number Six says k is based on 33 feet net pay.

A. Right.

Q. Now if you'll take Llano Exhibit Number Three and use the same type of average information indicated on that exhibit for making a material balance calculation, can you make a calculation to tell us how many acres are being drained by the Getty Two State No. 1 Well, if it has 33 feet of net pay in it?

A. If it has 33 feet of net pay in it, which I do not agree with, it would barely drain 75 acres.

Q. Based upon what gas in place figure?

A. Based upon -- based upon a 2-1/2 billion cubic feet gas in place volume and of using the average of the remaining wells in the field with respect to porosity, formation, water saturation, and such. This is a hypothetical figure but the illustration is that Llano does not think that the Getty Two State has 33 feet productive, because Llano was present at the time that the Getty Two State was perforated and tested below the Morrow

Clastics and did not produce sufficient even after an acid job to warrant completion, and Llano was present when the well was perforated and was aware of the fact that when the 3 to 4 feet of pay up above the Morrow Clastics was perforated, almost immediately the pressure, wellhead pressure, jumped to above 6000 pounds, which it did not do when other intervals were perforated below the Morrow Clastics for the second time.

Q. In your opinion where is the production coming from in the Getty State No. 2 Well?

A. Out of one zone above the Morrow Clastics and I will say that I think that is also Morrow, but to located it, it is above what we call the Clastic zone.

Q. If you would take that calculation for the Getty Two State No. 1 Well and increase the gas in place figure from -- what was the original figure used?

A. 2-1/2 billion.

Q. If you'll increase that to 7 billion, keeping all other factors the same --

A. And still using the 33 feet of net pay --

Q. Yes, sir.

A. -- you would barely drain 200 acres. Now mind you, Getty arrived at this 33 feet of net pay based upon an assumption of -- of total kh of 67-1/2 millidarcy feet and the assumption that the permeability is 2 milli-

darcy; therefore, one divided by the other gives you the height, which is 33 net feet.

Q. Mr. Klaar, in your opinion will approval of the Llano application for an unorthodox well location without a penalty of any kind be in the best interests of conservation, the prevention of waste, and the protection of correlative rights?

A. In my opinion it would be right and proper to approve 320-acre spacing without a penalty, yes, sir.

Q. Were Exhibits One through Twelve, I believe, prepared by you directly or compiled under your direction and supervision?

A. Both; by me directly and under my supervision, yes.

MR. KELLAHIN: We move the introduction of Exhibits One through Twelve.

MR. RAMEY: Without objection they will be admitted.

MR. KELLAHIN: That concludes my direct examination.

MR. RAMEY: Let's take about a five minute break.

(Thereupon a recess was taken.)

MR. RAMEY: The hearing will come to order. Any questions of Mr. Klaar?

MR. CARR: I have just a few.

MR. RAMEY: Mr. Carr.

CROSS EXAMINATION

BY MR. CARR:

Q. Mr. Klaar, I'd like to direct your attention to what has been offered as Llano Exhibit Number Two.

A. Yes, sir.

Q. I'd like to direct your attention to the Government A Well No. 1.

A. Correct.

Q. As I understood your testimony, some of the production which was recorded earlier today by Getty and attributed to this well is actually gas that came from the storage project, correct?

A. Correct.

Q. What well is that gas migrating from?

A. Our interpretation shows that it's migrating from Well No. 2, in Section 34.

Q. How far away is the No. 2 Well from the Government A No. 1?

A. Approximately two miles. Approximately two miles, Mr. Carr.

Q. So there is north-south communication over an area of two miles in this --

A. Oh, I said just from the No. 2, not from the No. 1.

Q. Okay, well how -- you talked -- I'm asking you --

A. I'm talking about a meandering sand that appears in the No. 2 Well, productive in the No. 2 Well, and is only productive in the Government A, but yet is not productive in the No. 1 Well in between.

Q. So your testimony here is that you have gas migrating for more than two miles through the Morrow.

A. Yes, sir.

Q. We also have established immediately north of this that we have east-west communication between the No. 1 and the No. 4, is that correct?

A. In another zone.

Q. In another zone.

A. Correct.

Q. If, in fact, there is this kind of communication, do you have any idea what the limits of these producing zones might be between the No. 1 and the No. 2?

A. Yes. I think if you look at the cross section there you will find that GRM Unit No. 3 is the only one that's got a C Sand. In some instances it's no

more than one well that's productive out of any one sand.

A. I'm asking you if you have any idea of the extent of this "meandering sand" that runs between the No. 1 and No. 2.

A. No, sir, because I don't know how wide it is.

Q. You do know that the rock characteristics must be such as to permit drainage over a very extended area.

A. Yes, sir.

Q. And if you would have a Morrow deposit that is not typical channel sand you would have rock properties that might in fact permit considerable area of drainage.

A. If that were the case, yes, except I think our cross section illustrates that --

Q. Didn't you just state that you didn't know what the limits of that meandering sand were?

A. Correct, but our cross section also illustrates that there are sands coming and going between all of the wells out there.

A. Well, I'm asking you about a particular sand. Do you have any idea how many acres are in that one?

A. No, sir, I do not know.

Q. But your testimony is that you are draining through one well an area two miles away.

A. Correct.

Q. Now I'd like to --

A. Which could turn out to be a sand about 50 feet wide and about 3 miles long.

Q. Do you know that?

A. No, sir, I do not.

Q. Do you know that it has -- or do you know if it has 14,000 acres?

A. I -- the only thing I know is that in retrospect, and going on the average information available to me at the wellbore, which is the log, the core data and every other type data, is that I have so many net feet available at the wellbore. From that I go out and I calculate how many acres I've drained. I have no knowledge of whether that drainage area is composed of 10-foot wide and 2 miles long, or if it's just -- or if it's elliptical in shape. I do not think it is circular in shape.

Q. But you also do know you have rock properties here that do permit you to drain over an extended area.

A. In individual zones, correct. Yes, sir. That's correct.

Q. I'd like to direct your attention for a minute to the Getty State Two No. 1 Well.

A. Okay.

Q. And correct me if this is wrong, but I

believe your testimony is that it is only producing from the interval above the Morrow Clastic.

A. Based upon our information of being -- being present at the time the work was performed, yes.

Q. And you believe today that that is the zone that's contributing the production, not the Lower Morrow zone.

A. That's correct. That could easily be proven, by the way.

Q. How many feet of pay are there in the upper zone?

A. As I remember, it could be five or six feet.

Q. Okay.

A. In that upper zone.

Q. Four feet, five feet, something like that?

A. Four, five, six feet.

Q. Did you see Getty's Exhibit Number Twenty-five this morning which indicated the rates of production from the Getty Two State No. 1 Well?

A. Yes, I did.

Q. Doesn't this in fact show that the rates are increasing?

A. Well, it shows several things. It shows that in July the well was capable of flowing 1.8 million a

day. That's July of '78.

Then it shows various smaller amounts that the well flowed, and back again in March and April of '79 it shows the well was again capable of 1.7 to 1.8 million a day.

I don't know whether I can agree that it's flowing more. No, not necessarily more.

Q. Is it flowing less?

A. It's flowing about the same.

Q. Now I believe your --

A. Eight or nine months later.

Q. I believe your testimony was with a normal Morrow Well you experience some sort of a decline in production.

A. That is correct.

Q. And what was that decline?

A. The decline is 35 percent but that has got a rider on it. That has the rider on it that you are producing the well at its full capability, which you're not doing here. You're choking it back.

Q. Now, let me ask you, based on the fact that you're not experiencing a decline --

A. Right.

Q. -- with this well, and that you've produced maybe half a billion to date, and you have only four

feet of pay, doesn't it appear to you that you would have a tremendous drainage area in this 4-foot interval in the Upper Morrow?

A. It could have quite a drainage area.

Q. Yet you still believe that based on this data that there is not contribution coming from the lower zone.

A. That is correct.

Q. Now, I believe you stated that in regard to your exhibit Number Three, I believe, our Exhibit Number Twelve, the same exhibit, thatyou would stand on your figures because you had more data available to you.

A. Now that's the --

Q. Is that a correct statement I --

A. That is the exhibit that does not include the Getty Two State, correct.

Q. Well, wouldn't the same standard also apply that Getty would have more data available on their Getty Two State and perhaps their opinion would be based on a better information bank than yours?

A. I can partially agree with that. I think we're bandying around -- bandying around the words drainage area when what we're really after is arguing about whether 640 acres will -- will be drained by one well. This well could very well in this one zone drain 640 acres. The

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point still is that one part -- one of the Morrow Sand zones. Can one well drain each and every Morrow Zone that has a possibility and a probability of appearing in that one section.

Q. Well, how many wells would you have to drill to be sure you caught all the possibilities?

A. You finally get to an economic limit and the conomic limit is somewhere between 160 and 320 acres, the point of no return.

Q. Well, I mean but would you then be sure you'd picked up all Morrow stringers?

A. Even at that point you're not sure that you have picked up all of them.

Q. That's right. Now, I believe you were talking about the number, at one time, how much gas would have to be in place and produced through one well, to in fact drain 640 acres, and you gave us some sort of a figure.

A. Right, that was based on -- just a minute, let me reconstruct that.

The question that had been asked was the same type of data that I utilized on the Getty 35, namely net thickness, average porosity, and such, where I had come to the conclusion that the Getty 35 would drain 262 acres, how much gas would the well have to produce under the same parameters to drain 640 acres, and my answer was approxi-

mately 15 or 15-1/2 billion cubic feet.

Q. Are you talking about producable gas or gas in place?

A. I'm talking about gas in place, I beg your pardon.

Q. Okay. Now, Mr. Klaar, if you have 11.3 billion gas producable, how much do you have in place, do you have any idea?

A. We use, as is illustrated by our exhibit there, we use a recovery efficiency of .8, which would mean 11.3 divided by .8 would come out to what, 13-1/2, 14 -- 14 billion cubic feet.

Q. And then you plug in your liquids and what do you get?

A. And you add your liquids and you get up to that 15, 15.5.

Q. So this is inconsistent with the other two volumes you've given concerning what the Getty 35 would produce.

A. I don't see how it's inconsistent.

Q. Well, on one hand you have --

A. I think one of the biggest disagreements is that as a purchaser of gas, I have to deal in reality; as a seller I run into people who deal in fantasies and they tell me they've got 12 to 15 billion cubic feet and

five years later I can prove they only had 4.

Q. Now we're not five years from today; we're today.

A. No, sir, but we are dealing with a 100 wells that I'm hooked up to at this present date, and my hindsight is 20/20, and I have looked back, and I've gone back and I've seen where, not to name any particular names, but to say Seller A has told me he's got 37 billion cubic feet available under this contract, and four years later after he's produced 11 billion cubic feet, his wells are gone.

Q. Do you ever have a producer who produces more than he thinks he might?

A. Not a single time. Everybody always sells more than they really have.

Q. Have you ever had anyone accurately calculate this?

A. In southeastern New Mexico in the Morrow there are very few people that accurately calculate. There are a couple of majors that do, yes, sir. I can give you names, but there's only a few majors that really accurately know what volume they're talking about.

Q. Isn't it true thatthe only way we really will know what this will drain is after we get some more data on the well and see how it performs as it's produced?

A. I can agree with that.

Q. Now, Mr. Klaar, if you drill a well at a close proximity to a fault, for the purpose of this question assume a generally homogenous area, will this not in fact reduce the amount of gas that you can actually drain? The presence of the fault as opposed to the same situation without it?

A. It can. Are you talking about a particular instance here if we were to move west, or what is your question?

Q. My question really is that the production from the four primary wells in your storage project has been affected by the presence of those faults, has it not?

A. I can't totally agree with that, no, sir.

Q. You don't think that the faults were -- the one on the west, further to the west, and the one on the east, further to the east, that you would have --

A. Not necessarily.

Q. That those wells would have produced more during primary --

A. Not necessarily. As our cross section indicates, sand bodies go across faults, but that's just the yellow portion of the cross section.

It's the red you're really interested in. That's the porosity. The porosity in itself comes and goes

inside these sand bodies. Some are productive and some aren't. You could have the thickest sand body you ever saw be so tight and you not be able to produce it.

Q. Generally speaking, then, you would believe that a well immediately adjacent to a fault would be able to produce just as much as one that was out in the middle of a homogenous reservoir.

A. Just as much as one that was out in the middle of a homogenous reservoir.

Q. Not bothered -- not hampered by the fault.

A. No, I wouldn't agree with that, either, because we don't have -- there is no such thing as a homogenous reservoir in --

Q. I'm talking about the presence of the fault.

A. Okay.

Q. For the purpose of the question I'm asking you to assume a homogenous reservoir.

A. Okay, if you assume a homogenous reservoir, then, and you have faults on either side, like we do, then what's the question?

Q. The question is does the existance of the fault in fact reduce what you will produce in those wells? As contrasted to the situation where the faults are not present?

A. If the producing interval is just laying across those faults, yes. If the producing interval is laying the other way, then the faults could be no more than an indication of structure.

Q. But you're changing the assumption.

I'm asking you to assume a homogenous reservoir.

A. Okay, assume a homogenous reservoir, a fault, a sealing fault, would certainly keep you from producing.

Q. I'd like to look -- I'd like to direct your attention to your Exhibit Number Seven, your cross section.

A. Right.

Q. I believe it was your testimony that we have the gross sand intervals indicated in yellow and the net productive sands in red.

A. Yes.

Q. Is it your opinion that -- is it your opinion that -- I want to try and understand you -- that the gross sand intervals that are in yellow, are not productive?

A. If they are indicated in the wellbore as yellow with no red in there, that is correct.

Q. So it is your testimony that, take the, let's see, the Getty Number 35, the top sand interval colored

yellow in that, you believe that is not productive?

A. It's not productive at this time, no, sir.

Q. You're talking about just at this time.

A. Just at this time. In this instance --

Q. If it were perforated --

A. -- I think they could perforate and they could make it productive.

Q. So you're talking, when you say productive, you mean just producable through a well under current conditions.

A. Under current conditions.

Now with respect to Llano's wells, Shell, Sinclair, and others who had interests in these wells, by cores and drill stem tests determined what was productive and what was not productive, whether or not it was a sand body.

Q. Now I'm going to ask you just a very simple question.

What are the spacing rules which govern Section 34, Township 21 South, Range 34 East?

MR. KELLAHIN: Excuse me. What was the question again?

MR. CARR: I'd just like to have Mr. Klaar tell us what he understands the acreage dedication and well spacing rules to be which apply to the area which

you are trying -- proposing to dedicate to your well in Section 34.

MR. KELLAHIN: Object to the question. It's wholly irrelevant. That's why we're here today, spent eight hours here today, is to figure out what the spacing and pool rules are.

MR. CARR: I would submit that you don't, because of the hearing in Santa Fe, have no rules in southeastern New Mexico governing the way -- an area where wells are drilling or productive.

I think one of the basic misconceptions we're operating under is that at the present time, that on the day that the Llano well was spudded there were no rules.

MR. KELLAHIN: Well, I'd object to --

MR. CARR: That they were on 320.

MR. KELLAHIN: If the Commission please, we're operating under an effective order --

A. No, sir, we're --

MR. KELLAHIN: Excuse me, let me finish. We are operating under an effective order from Examiner Nutter and it allowed us to drill that well at that location

That answers his question.

MR. CARR: We're not disputing their right to drill and we have not today disputed their right to produce whatever they may have, but I'd like to know what the

rules are.

Mr. Klaar is representing a company which is drilling a well, and my question is, is it on 640-acre spacing or 320.

MR. KELLAHIN: I renew my objection.

MR. CARR: I'd ask you to rule on this.

MR. RAMEY: Going to overrule the objection. Would you answer the question, if you can, Mr. Klaar.

A. The rules we are operating under at the present time say 640-acre spacing.

Q. So, Mr. Klaar, the --

A. Temporary for thirty days, so this is why this hearing is going on.

Q. So at the present time with 640-acre spacing in effect, your 660 acre location --

A. 660 foot location?

Q. From the east line of 34.

A. Right.

Q. How many feet unorthodox is that?

A. With 640-acre spacing rules that's 990 feet unorthodox towards the east.

Q. Towards the Getty property.

A. Yes, sir.

Q. Now I believe you testified that you be-

lieved granting your request for this unorthodox location with no penalty would not impair correlative rights.

A. That's correct.

Would you like to know why I think that?

Q. Yes, I would.

A. First of all, the offset well has been productive for, as shown by Getty, for five or six months, will be productive up to ten or eleven months, should we ever be able to drill down to that point and start producing it. By that time Getty could have already drained the total of a billion cubic feet from wherever it came from.

So I do not think that if it changed to 320-acre spacing that they would be at a disadvantage, nor do I think if it changed to a 6 -- or if it remained at 640-acre spacing with some type of penalty put on Llano would they be at a disadvantage. In fact, if it remained at 640 acres, then I would imagine Llano would come in and in addition to a penalty factor being assessed against them would also ask for that same amount, whatever that net factor is, to be given to Llano of the present production that Getty's already got.

Q. Has Llano been denied opportunity to produce its fair and equitable share of reserves under the east half of 34?

A. As far as I know, no, sir.

Q. Did you know that's how correlative rights is defined?

A. That is the definition of correlative rights, that's right.

No, sir, we have not been denied. I mean it's -- we're here to settle the question of what spacing rules should be, and once that's settled and the Commission decides who gets what.

Q. Now you're drilling 660 from a common lease line and there's an offsetting well 650 on the other side of that line.

A. 1650.

Q. 1650, right.

A. Correct.

Q. Do you believe that the well 1650 from the east line -- or that's east of this common line, can protect itself with counter drainage from the drainage which results from the well 660 from the west of that line?

A. I think I'd have to qualify the answer and say at the time our well would, and if it ever is completed and we find out how good a well it is, that would be the time to answer that.

We could end up with a well capable of 1-1/2, say 1500 Mcf a day versus Getty's capable of producing out of the same zones 3800, as it was quoted, Mcf a

day. If that were the case and our well cannot produce more than 1500 Mcf a day, no, sir, and I don't think the Getty 35 is being hurt by our well producing 1500.

Q. Now, do you believe that by being permitted to move a well 1000 feet toward your neighbor's lease, that you in effect gain an advantage on your neighbor?

A. I think in general when you talk about moving 1000 feet, that's the way you would look at it, except Llano has -- has no recourse except to claim its right to produce the gas under the east half of 34, and we feel --

Q. Has anyone denied you that right?

A. No, sir.

Q. Has Getty?

A. No, sir, not that I know of.

The question here is should it be 640 or 320.

Q. Isn't the question whether you're entitled to produce your fair share of the gas?

A. Once the question of 640 and 320 is settled, then it comes down to whether Llano agrees with the Commission that it's going to get its fair share.

Q. Well, let me ask you this. Suppose we go to 320-acre spacing.

A. Yes, sir.

Q. That would mean that it would free up another proration unit in Section 35 for Getty.

A. Yes, it would.

Q. Now, inasmuch as the Getty 35 is in the southwest quarter, they could either have a section across the north half of the section or the west half.

A. Correct.

Q. Or the east half of the section.

A. Correct.

Q. Is there any possible way with that kind of a rule change, that they could come and drill an additional well and offset you 660 feet from the east line in Section 35 -- I'm sorry, and offset you 660 feet from the west line and 1650 from the south line?

A. Not legally. They would have to come in then and get an unorthodox hearing, just like we had to.

Q. Well, but it would be more complicated than that. There would be simultaneous dedication problems, too, wouldn't there?

A. Not if you had the Getty 35, south half of Section 35 dedicated to the present well, and the north half to the new well, and then you would be seeking an unorthodox location.

Q. But you couldn't put a well 1650 from the south line, could you? It wouldn't be in your unit.

A. Well, you've already got a well there 1650 from the south line.

Q. Isn't the net effect of going from 640-acre spacing to 320-acre spacing, isn't the real net effect of that, that you would -- that Llano would be able to drill a well 660 feet from the east line of Section 34 and not be assessed a penalty?

A. That could be interpreted, just as the net effect of Getty wanting to keep it at 640 could be interpreted as meaning $2,000,000 more to Getty.

Q. But now I'm talking about the location and you're asking for an unorthodox location.

A. I'm talking about 640. Getty wants to keep it at 640.

Q. Well, I'm asking you -- I'm asking a question.

A. Yes, sir.

Q. And isn't one of the -- one of the real net effects of the application, that if the Commission changes the spacing to 320, Llano would be able to drill a well 990 feet closer to the east line of Section 34 and not receive a penalty for that?

A. That is part of it. Llano is more than willing to accept a penalty factor if it goes to 640, if it remains -- I beg your pardon for saying goes, but if it

remains at 640, then Llano obviously will get a penalty factor slapped on it, and Llano is willing to live with that.

Q. Doesn't this change in effect amount to changing the rules in the middle of the game?

A. Now that has been mentioned several times, Mr. Carr, and all I can answer to that is then the rules have been changed in the middle of the game just about a dozen times, according to my Exhibit Number Eight, out of all those Morrow Pools, because this is not the first, and I suspect it is not the last, pool that will go from 640 down to 320 once more activity takes place.

MR. CARR: Well, I have nothing further on cross of this witness.

MR. RAMEY: Any other questions of the witness?

MR. KELLAHIN: Let me ask you one question, Mr. Klaar.

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Exhibit Number Three.

A. Exhibit Number Three?

Q. Yeah. Mr. Carr asked you under cross examination about the extent of some of these Morrow stringers in this particular area, and that it was conceivable for

them to be, I think you said ten feet wide and more than a mile long, that kind of characterization, I think was your testimony. Was that not your testimony?

A. Essentially, yes. What I was trying to say is that I have no knowledge about the actual configuration. I draw inferences when I have a well that is completed in one zone, in a particular zone, and then I go down one mile to the south, I do not find that zone productive. I go another mile further to the south and I find it productive again.

All I can -- the conclusion that I have to draw from that is that since I do see communication, is that that is some type of a boomerang configuration of that zone around that well, that's productive.

Q. My question is that dispite the fact that you do not know what the exact configuration of the drainage pattern is, have you calculated on Llano Exhibit Three what the limits of that configuration would be in terms of acres drained?

A. Yes, sir, acres is an areal extent of the acres drained, correct.

Q. Do any of your calculations show that you are draining 640 acres?

A. No, sir, they do not.

MR. KELLAHIN: No further questions.

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Klaar, if the Commission did decide to keep this acreage on a 640, have you any thoughts of what an effective penalty would be for the Llano well on an actually 320-acre tract?

A. No, sir, because I'm not familiar with several references that were made today here to the case of how this is figured.

I'm sorry, I'm not familiar with that type of proceeding, so I have no -- no recommendation on what type of a penalty it would be.

Q. You have no recommendations for a minimum allowable?

A. No, sir.

Q. Mr. Kellahin touched on it briefly with Mr. Bosecker when he asked him if 2,000,000 a day was a good one and he said no; he said 1 million and a half and he said he was getting close.

But you, you have no recommendation?

A. No, sir, I do have one thought on it and that is that if a penalty is assessed whether this is Llano or anybody else, if a penalty is ever assessed on a well that is in with other wells in a gas pool, then the only

equitable way of doing that is by prorating that pool.

Q. And what would be your request for an allowable for that pool if it were prorated and you were purchaser?

A. That's hard to say right now.

Q. Would it be a reasonable figure or would it be some figure that would not be attainable right away on --

A. Well, the first thing that comes to mind is if my request for allowable in a prorated pool is excessively high to what the wells can produce, the second month I nominate high the Commission knows about it because it goes back in retrospect and looks at what was actually produced and says, hey, something's going on.

There are provisions in nominating on prorated pools to take into account the difference between nominations and actual production.

So what I'm trying to say is that there is no way that I think a purchaser could manipulate the nominations to suit his own purposes, because it would show up with either an overage or underage sooner or later, and an adjustment would be made on the allowables thereafter.

MR. RAMEY: Any other questions of the witness? He may be excused.

Mr. Kellahin, do you have anything further?

MR. KELLAHIN: No, sir.

MR. RAMEY: Mr. Carr?

MR. CARR: I'll only ask the Commission to remember their statutory charge to protect correlative rights, and emphasize that if Llano is permitted to drill and complete a well offsetting us at the 660 location as they propose in Section 34, there is no possible way that we could come in and offset them at 660 and that, in fact, I mean the evidence shows that our correlative rights would be impaired and we would be unable to protect them and would not have been afforded an opportunity to do so.

Further, 640-acre spacing in this pool, we've drilled wells at standard locations under those rules. The present well being drilled by Llano and the one being drilled by Getty are being drilled under rules of that nature.

We feel that to change the rules now and to permit wells at unorthodox locations and then not assess a penalty because of the change in the overall spacing would be in effect changing the rules in the middle of the game, would deny us an opportunity to protect our correlative rights and would in effect be contrary to your statutory charge.

MR. RAMEY: Thank you, Mr. Carr.

MR. KELLAHIN: May I have a response, sir?

MR. RAMEY: Yes, Mr. Kellahin.

MR. KELLAHIN: Mr. Carr has alluded to the fact that we're playing some kind of game here. We're being very serious about this.

It is incumbent upon the Commission, as you know, to first of all insure that the spacing rules for regardless of what kind of pool are developed, are the spacing rules that are most effective and efficient to develop that particular pool.

This case is not any different from any of the other Morrow cases you've heard over the years. Mr. Carr would have you believe that this is one of the nine exceptions out of a hundred Morrow Pools in which they should be established and continue of a 640-acre spacing.

That in fact is not true. We can demonstrate, and have demonstrated for you, that the most effective and efficient way to develop this pool and not bypass Morrow stringers, is to do so on 320-acre spacing. It will not adversely affect Getty in any way.

You can look at the locations of the wells with regard to Getty's spacing pattern and you can see that in each of those sections you go to 320-acre spacing, that they will have additional locations from which to further develop their acreage.

The occurrence of the fault between the

storage wells that Llano operates and those that Getty is now drilling and has produced, has created a situation where there is productive acreage, as everyone admits, in the east half of Sections 34 and Section 3.

The unit agreement between Llano and the State of New Mexico places a burden upon Llano to protect that particular part of the acreage dedicated to the unit, and exercising that obligation has been encumbent upon them once they realize from the information supplied by Getty that there was a fault line splitting that acreage in half that they -- it was incumbent upon them to commence a well on a location in the east half of Section 34. That location will be a standard location for the east line if the well is spaced upon 320 acres.

That brings us full circle back to the point that the fundamental decision to be made by the Commission is what is the most appropriate spacing. We believe no one's correlative rights will be damaged by reducing the spacing to 320 acres and approving the location without a penalty.

MR. RAMEY: It certainly would have been simpler if that fault had been a half a mile east.

Do you have anything further, Mr. Carr?

MR. CARR: I would just ask the Commission to note that there are letters in the record in support of

the position of Getty.

MR. KELLAHIN: May we know who those letters are from?

MR. RAMEY: We have a letter from Sabine, In Case 6557 we concur with the 640 spacing.

In 6497 they object to the application of Llano to drill an unorthodox well.

In 6558 they object to the application of Llano for a non-standrd proration unit.

A letter from Phillips supports the application of Getty seeking to create a new Morrow gas pool under the subject case assignment.

They support 640-acre spacing.

And we have a telegram from Exxon saying they're a leasehold interest, leasehold owner in Section 11, Township 22 South, Range 34 East.

MR. KELLAHIN: Excuse me, who is that from?

MR. RAMEY: Exxon. And they support Getty in the 640 spacing.

MR. KELLAHIN: May the record also reflect that for the Phillips and Sabine letters, that they are working interest owners in the Getty 36 Well now being drilled in Section 36.

MR. RAMEY: Do you have anything further?

MR. KELLAHIN: Not in this record.

MR. RAMEY: The Commission will take these three cases under advisement, and the hearing is adjourned.

(Hearing concluded.)

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REPORTER'S CERTIFICATE

I, SALLY WALTON BOYD, a Court Reporter, DO HEREBY CERTIFY that the foregoing and attached Transcript of Hearing before the Oil Conservation Division was reported by me; that said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability, knowledge, and skill, from my notes taken at the time of the hearing.

Sally W. Boyd CSR

Sally W. Boyd, C.S.R.

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